AUGUST 1954

# American Engineer

UNIVERSITY OF MICHIGAN
AUG 13 1954
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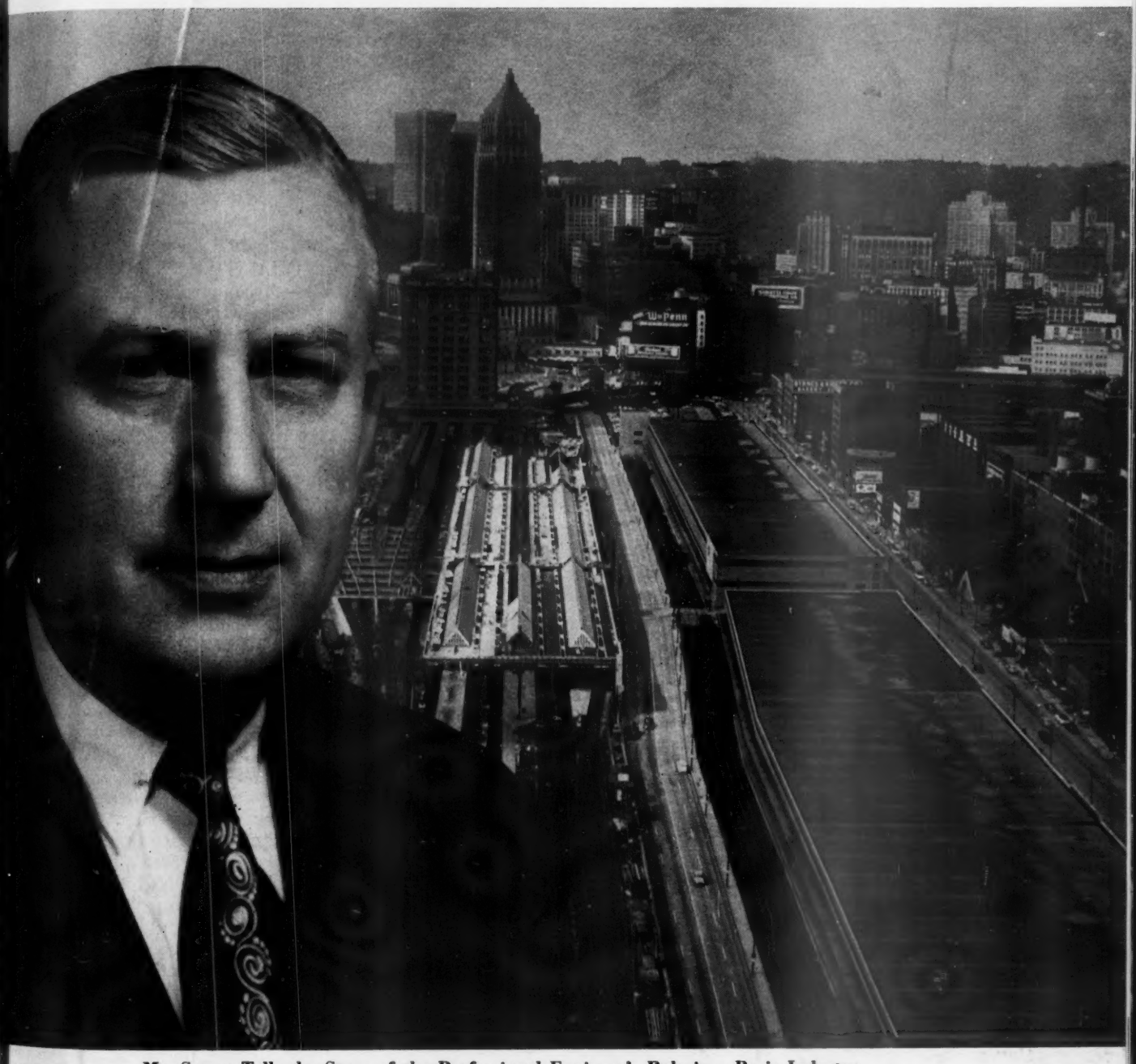
## IN THIS ISSUE . . .

● **The "Game" That Needs Professional Engineers**

**By**
**James M. Symes,**
***President, The Pennsylvania Railroad Co.***




**Mr. Symes Tells the Story of the Professional Engineer's Role in a Basic Industry**

## . . . *Also*

**Engineering and Industrial Development in the U.S.S.R.**
**By J. D. A. Morrow**

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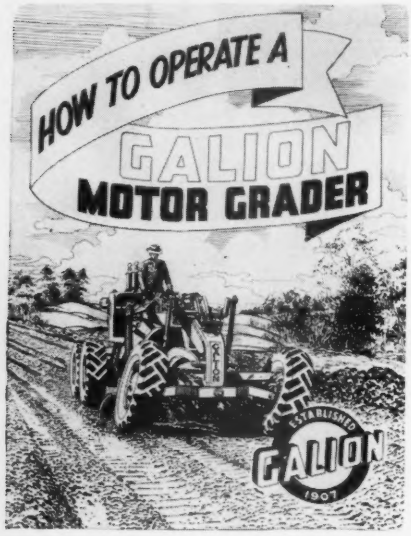


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—AE—

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**SILICON TRANSISTOR BULLETINS—Descriptive literature on the first commercially available silicon transistors is announced by Texas Instruments Incorporated. Bulletins are available on both the Types 900 and 901 general purpose silicon transistors and the X-15 medium power silicon transistor. The silicon transistors offer higher power outputs and more independence from ambient temperatures than their germanium counterparts. For copies of silicon transistor bulletins, write to Texas Instruments Incorporated, 6000 Lemmon Avenue, Dallas 9, Texas.**

—AE—

INDUSTRIAL PROPELLERS BROCHURE—Illustrations of typical industrial installations of blade-equipment in aerating, agitating, mixing and pumping units point up the interest in this brochure offered by the Columbian Bronze Corporation, known also for its manufacture of marine propellers. The multi-blade designs range from 8″ to 20′ in diameter. They are employed in such diversified processing as ice-making, sewage treatment, paint mixing and are also used in chemical plants. A free copy of the brochure may be requested on the letterhead of any manufacturer or processor by addressing: Columbian Bronze Corp., Freeport, L. I., N. Y.

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—AE—

**NEW MANUAL ON CLEANOUTS AND ACCESS COVERS —A comprehensive new 32-page Manual No. 54-4 on Supremo Perfect Seal Cleanouts and Access Covers, was announced by the J. A. Zurn Mfg. Co., Plumbing Division, Erie, Pa. Designed to provide the consulting engineer and architect with a complete reference manual on Cleanouts and Access Covers, Code requirements and the importance of preventing "trouble zones." An important section is devoted to recommended standard specifications in Cleanouts, Access Covers and materials. The Product Section of the manual gives complete application, installation, technical diagrams and other important data. Also detailed information on where the products should be used most effectively. Copies of Manual 54-4 can be obtained by writing direct to the J. A. Zurn Mfg. Co., Plumbing Division, Erie, Pa.**

# Letters

## *Hard Work Needed . . .*

Dear Editor:

The letter by George C. Barnes, Jr., P.E., of Blacksburg, Va., and the article by Major General S. D. Sturgis, Jr. (both in the May, 1954, issue of the AMERICAN ENGINEER) seem to clarify the reasons for weaknesses in our profession. Many present engineers and most of the future engineers need to be more firmly impressed with the need for good old, honest, *hard* work. It may well be that we were oversold, some years ago, on the "life of ease" supposedly made possible through technological advances.

The points that were made in the above noted references were that prospective engineers are going to have to be made to dig into fundamentals of engineering instead of social studies and present engineers are going to have to take greater pride in doing a job well done. Both of these call for hard work, contrary to misconceptions apparently existing in the back of the American mind.

H. A. JANZEN, P.E.
Chanute, Kansas.

## *Better Students Today? . . .*

Dear Editor:

While reading your article, "Have We Lost Control of Our Profession?", in your May issue of the AMERICAN ENGINEER, I would like to note an objection to the last paragraph on page 10. In this paragraph the author made note of the percentage of enrollment in specific courses of all public high school students in the United States for one year. On that basis it would be possible for only 25% of the total enrollment to attend any given course during that year, and therefore the low percentages listed are very misleading. In that same paragraph he also indicates the percentage of students capable of solving specific problems.

I would like to refer to an article in the June issue of *Changing Times* magazine entitled "The Truth About Our Public Schools." This article makes more worthwhile use of statistics, in that the percentages are on the *same* tests given to students in the 8th grade in 1848 and to similar 8th grade students a few years ago. In this case the first number given refers to the grades of the 1848 pupils and the second of the present day pupils. In mental arithmetic 40.07 - 44.3; written arithmetic 33.00 - 33.08. In definitions 31.5 and 63.0. These percentages show that today's students are equal to or better than equivalent students of 100 years ago and they do not express the percentages based on a specific problem as your article does.

I believe that an article on the general level of scientific education for the average public high school students does not present a true picture since these percentages include a large percentage of women who do not intend to enter scientific fields and male students whose chief interests lay in the fields of arts and crafts.

LOFTIN E. ELVEY, E.I.T.,
West Lynn, Mass.

## *Educational Systems . . .*

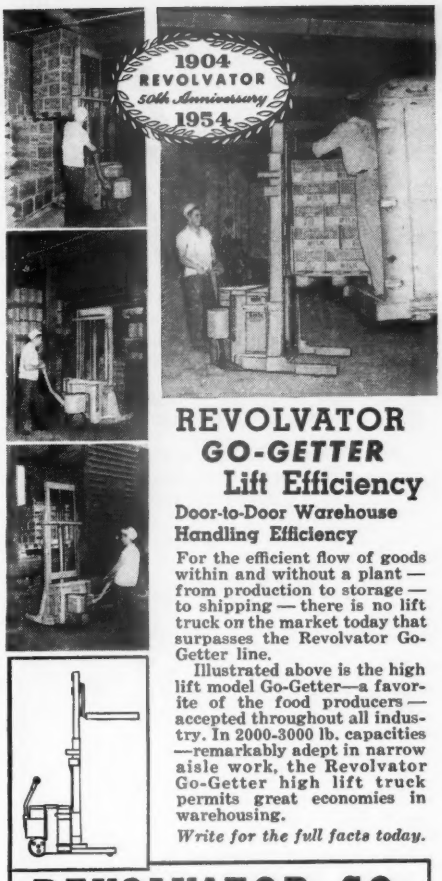
Dear Editor:

General Sturgis' article, "Have We Lost Control of Our Profession?", in the May, 1954, issue of the AMERICAN ENGINEER contains an indictment of American education which, although valid in many respects, is not based upon what I feel to be the real cause of the degradation and simplification of college and pre-college intellectual activity.

This past semester I gave a course at Teachers College, Columbia University, titled "Basic Electronics and Psycho-acoustics as Applied to Audiology and Speech." Teachers College is the place where John Dewey first preached "Progressive Education" (which only a few private schools practice today) and where his student, William Heard Kilpatrick, preached "social adjustment." I have spoken to students and to faculty members of Teachers College who know the philosophy and practice of "Progressive Education" more intimately than any outsider could. They inform me that not only are the students who have been taught by progressive education better adjusted to their environment than are the students who have been subjected to the more formal type of teaching but these students have also mastered more of the subject matter. This is shown by objective tests. The degradation of primary education is not due to progressive education; it is due to a more fundamental cause.

The American people feel that everyone is "created equal" in all respects. Unfortunately, intellectual equality is not a prevalent condition. Any engineer who thinks back to his college days and recalls the great number of those who were dropped from the various engineering curricula can attest to this. This false concept of intellectual equality combined with a higher standard of living has caused an idea to sweep the country which is commonly stated as "everyone is

*(Please turn to page 5)*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# American Engineer

AUGUST, 195


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*—On the Cover—*

Pennsylvania R. R. President James M. Symes is shown superimposed on a view of the Pennsylvania Station in Pittsburgh, upon which the firm is spending $27,500,000 for rebuilding and modernization.


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*(Continued from page 3)*

ntitled to a college education." No matter ow little benefit may be derived from it, no matter how intellectually unqualified a person might be, he is entitled to a college education.

Let us remember that the educational system is only what the public wants it to be. As one of the great thinkers of the twentieth century, Jose Ortega y Gasset, put it "in a democracy public opinion ultimately rules." Since the public feels that anyone can go to college the standards of the colleges and of the college preparatory schools must be lowered to accommodate the great masses of mediocrity who must be educated. Consequently there is a lowered enrollment in the areas of knowledge that require a great deal of work and thought for their mastery, such as mathematics, science, and languages.

In many institutions that depend upon student fees for their existence, standards have been lowered to rock bottom levels. Public colleges which by law must take in a great many who are unqualified, fortunately can be quite ruthless in eliminating the unfit. It is in the public colleges that the hope of intellectual America lies. Here we get quality, not quantity, in the engineers graduated. Remember, a good engineer can turn out more and better work than several poor engineers.

The figures presented by General Sturgis show that the American people are not getting the best education because they do not want the best education.

JEROME GOODMAN, E.I.T.,
Brooklyn, N. Y.

## *What Shortage? . . .*

Dear Editor:

In your issue of AMERICAN ENGINEER in June, 1954, a letter to the editor delineated the idea that there was no shortage of engineers. To this belief I'll wholeheartedly agree. I believe Mr. Whatshisname, who states there is a shortage, procured his information from management; not from the engineers.

Management will always state that there is a shortage—of *good* engineers. Likewise there is a shortage of *good* doctors, welders, laborers, editors, and good cigars.

Being an engineer let's not overinflate a young engineer's head with "worth" and shortage. The row is hard enough to hoe without it. Just give 'em the facts and forget the histrionics and factitious.

JAMES H. CATES, E.I.T.,
Corpus Christi, Texas.

## *Long Hours, Low Wages . . .*

Dear Editor:

Please extend my sincere congratulations to Mr. William N. Marshall, Jr., of Kansas City whose letter in the June issue of the AMERICAN ENGINEER vividly mirrors the plight of the young engineer who must shy away from any contact with unionization to preserve his professional status, yet must suffer long hours, low wages, and lack of recognition because no other organization exists to champion his cause. It appears as though the ultimate solution may be to organize salaried and non-salaried engineers separately in professional societies.

GERALD GELLER, E.I.T.,
Atlanta, Georgia.


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# Professional News in Capsule Form

**N. W. Dougherty Heads American Society for Engineering Education • Wisconsin Professor Receives Outstanding Teacher Award • National Science Foundation Makes Survey Plans • Frank C. Mirgain Accepts Dean of Engineering Post • Engineering Societies Select New Officers • Other Items of Interest**

**N. W. Dougherty, dean of engineering at the University of Tennessee and a past vice president of NSPE, was elected president of the American Society for Engineering Education during the organization's recent annual meeting at the University of Illinois in Urbana.**

**Dean Dougherty has long been active in professional and educational circles in the field of engineering. He holds a B.S. degree from the University of Tennessee and both C.E. and M.C.E. degrees from Cornell University. He has taught at Cornell and at George Washington University in Washington, D. C., in addition to the University of Tennessee; and he is a member of the American Society of Civil Engineers, the American Association for the Advancement of Science, Tau Beta Pi, Phi Kappa Phi, Sigma Xi, and Chi Epsilon. He has also been serving as chairman of the Tennessee State Board of Examiners for Architects and Engineers.**

* * *

*Dr. Thomas J. Higgins, professor of electrical engineering at the University of Wisconsin and a member of the WSPE and the National Society, has received the $1,000 Westinghouse Award for Outstanding Teaching for 1954.*

*The Westinghouse-sponsored award is presented annually to the person selected as America's outstanding teacher in the engineering field as a special feature of the annual meeting of the American Society for Engineering Education.*

*Dr. Higgins has been a member of the University of Wisconsin's faculty since 1948. He is a graduate of Cornell University and earned his Ph.D at Purdue University. He has to his credit more than ninety technical papers on various phases of analytical and experimental research in electrical engineering.*

* * *

**Plans for four additional special studies to be conducted by Federal and private survey groups as part of the previously-announced National Science Foundation survey of science in the United States have been announced by NSF Director Alan T. Waterman. The four studies will be: A survey of Industrial Research and Development, A Survey of Research by State Governments, A Survey of Research by Trade Associations and Similar Organizations, and A Survey of Research at Nonprofit Institutes and Commercial Laboratories.**

* * *

*Frank C. Mirgain, a past president of the New Jersey Society of Professional Engineers and a former director of NSPE, has accepted an appointment as dean of engineering at North Dakota Agricultural College. To accept the new assignment, Mr. Mirgain leaves the position as head of the Department of Civil Engineering at the Cooper Union in New York City, which he has held since 1949.*

*Mr. Mirgain holds degrees from Purdue and Rutgers Universities, and he is a member of Tau Beta Pi and Sigma Xi. He is also a former vice president of the metropolitan section of the American Society of Civil Engineers, and he has been an active member of the Highland Park, N. J. Planning board, his residence being in the latter city.*

* * *

**The election of George J. Taylor, a member of the New York State SPE and NSPE, to the office of treasurer of the Illuminating Engineering Society has been announced following the report of the Committee of Tellers at a recent IES Council meeting in New York City. Mr. Taylor is the eastern sales manager for Day Brite Lighting, Inc., of New York City.**

**Newly elected as president of the organization is Duncan M. Jones, eastern Canada representative of Curtis Lighting of Canada, Ltd., Montreal. He is the first IES member from Canada ever elected to the principal office.**

**Other incoming IES officers who will take over their duties October 1st with Mr. Jones and Mr. Taylor, are: Marshall N. Wa**


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terman, vice president; Kirk M. Reid, general secretary; and L. C. Twichell and John S. Walsh, directors. R. F. Hartenstein will also start the second year of a two-year vice presidential term on October 1st.

* * *

*Ben G. Elliott, chairman of the Department of Mechanical Engineering at the University of Wisconsin and a member of the Wisconsin SPE and NSPE, has been nominated as one of the incoming vice presidents of the American Society of Mechanical Engineers.*

*David W. R. Morgan of Swarthmore, Pa., vice president on the headquarters staff of Westinghouse Electric Corporation, was selected by the ASME Nominating Committee for the presidential post.*

*In addition to Professor Elliott, other ASME vice presidential nominees are James B. Jones, head of the Department of Mechanical Engineering at Virginia Polytechnic Institute, and C. H. Shumaker, chairman of the Department of Industrial Engineering at Southern Methodist University.*

*Nominees for directors-at-large include another NSPE member — Harold C. R. Carlson, president of The Carlson Company of New York. Other directors nominated by the Committee are George A. Hawkins, Purdue University professor of thermodynamics, and Louis F. Polk, president, The Sheffield Corporation.*

* * *

**Dr. Blake R. Van Leer, president of the Georgia Institute of Technology and well-known member of the Georgia SPE, has been elected a Fellow of the American Association for the Advancement of Science, according to Dr. Warren Weaver, president of the organization.**

**Each year the Council of the Association elects several outstanding members to the grade of "Fellow," basing the selection on the members' contributions to research and their standing as scientists.**

* * *

*Dr. David B. Steinman, NSPE's distinguished first president, has recently been decorated with the French Legion of Honor by the Government of France. The presentation of the honor was made on behalf of President Coty of France by Count Jean de Lagarde, French consul general, at a ceremony and reception at the French consulate in New York City on Dr. Steinman's birthday. The citation accompanying the award took note of Dr. Steinman's accomplishments as a*

(Continued on page 8)


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## Briefs

(*Continued from page 7*)

*bridge-builder, author, and professional leader as well as his contributions toward the strengthening of international friendship.*

* * *

**Peter A. Strobel, a prominent member of the New York Society of Professional Engineers and NSPE, has recently accepted appointment as U. S. Commissioner of Public Buildings. The appointment makes Mr. Strobel responsible for about 6,000 Federal buildings worth more than one billion dollars, in Washington, D. C., and throughout the country.**

* * *

*Elmer R. Kaiser of Columbus, Ohio, has been named as the new director of research for the American Society of Heating and Ventilating Engineers. Mr. Kaiser, who leaves the post of associate director of research in charge of the Bituminous Coal Research Laboratory at Columbus, will take over his new post in Cleveland about September 1st.*

*He holds B.S. and M.S. degrees in mechanical engineering from the University of Wisconsin, is a registered professional engineer in Ohio and Pennsylvania, and is a member of many engineering and professional groups.*

* * *

**Recent ceremonies in Richmond, Va., marked the presentation of the National Safety Council's top Award of Honor for 1953 to the East Ocean Division of the Army's Corps of Engineers. Brigadier General Robert G. Lovett accepted the plaque which commended the Division "for distinguished service to safety" in the construction of military installations in Canada, Greenland, and Iceland.**

*Dr. Charles D. Luke, chairman of the department of Chemical Engineering at Syracuse University since 1940, has been appointed director of the Office of Classification of the Atomic Energy Commission, according to an announcement by K. D. Nichols, AEC general manager. Dr. Luke will succeed Dr. James G. Beckerley who is resigning as of August 31.*

*In his new post in Washington, the well-known chemical engineer will be responsible for the administration of the AEC's policies for the classification and declassification of atomic energy information. No newcomer to the atomic energy field, Dr. Luke was assigned to the Manhattan Engineer District during his World War II military service, and later he was operations officer for the gaseous diffusion plant at Oak Ridge, Tennessee. He also served as a consultant to the Commission from 1950 to 1952.*

**The Graduate School of Industrial Administration at Carnegie Institute of Technology has received a grant of $132,000 from the Ford Foundation to finance a three-year program of research into the organization of business firms, according to an announcement by President J. C. Warner. The grant expands an earlier award of $35,000 made last year to the school for an "inventory" of existing knowledge on how organizations operate.**

* * *

*Dale M. Maffitt, president of the Des Moines, Iowa, Water Works, and newly-elected president of the American Water Works Association, has been awarded a special plaque by Iowa's Governor William S. Beardsley in recognition of his outstanding contributions to the field of water works engineering.*

# Societies Oppose Engineering By Construction Contractors

The Indiana and Ohio State Societies have taken steps designed to prevent the performance of engineering services by construction contractors. Both incidents relate to the construction of highways.

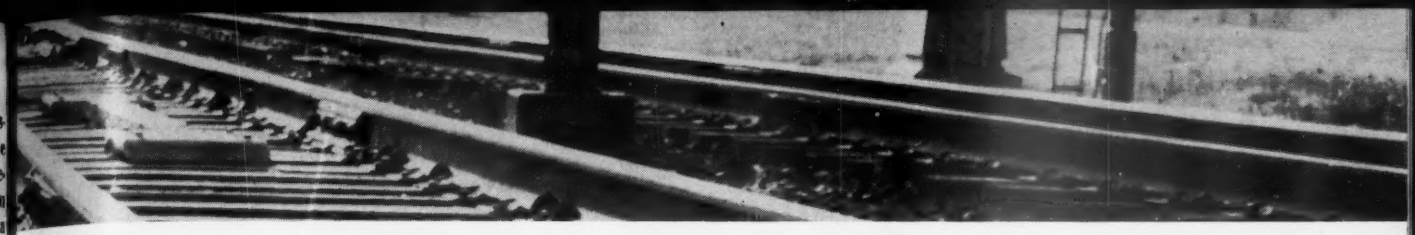
The situation in Indiana arose from an initial decision of the Indiana Toll Roads Commission to have construction engineering work done by the construction contractors in conjunction with their work on the new east-west toll road. Having in mind the unionism problem which arose in Ohio under the same circumstances (AMERICAN ENGINEER, June, 1954, p. 20), the Indiana Society requested that the arrangement be changed and that the engineering work be let to professional engineering firms. It was pointed out that trade unions would probably try to organize the engineering employees of the construction contractors on the ground that the trade union already represented most of the other construction contractor employees.

Following a series of conferences with the Indiana Commission and the prime engineering consultant firm, attended by representatives of ISPE and NSPE, and with the advice of the Ohio Society, based on their experience under similar circumstances, the Indiana Commission revised its procedure in accordance with the ISPE proposal.

The current Ohio situation involves the decision of the Ohio Director of Highways to let construction contractors perform the necessary engineering services. The Ohio SPE has protested the plan, declaring that it is of doubtful legality and requesting that the practice be eliminated pending a ruling from the State Attorney General.

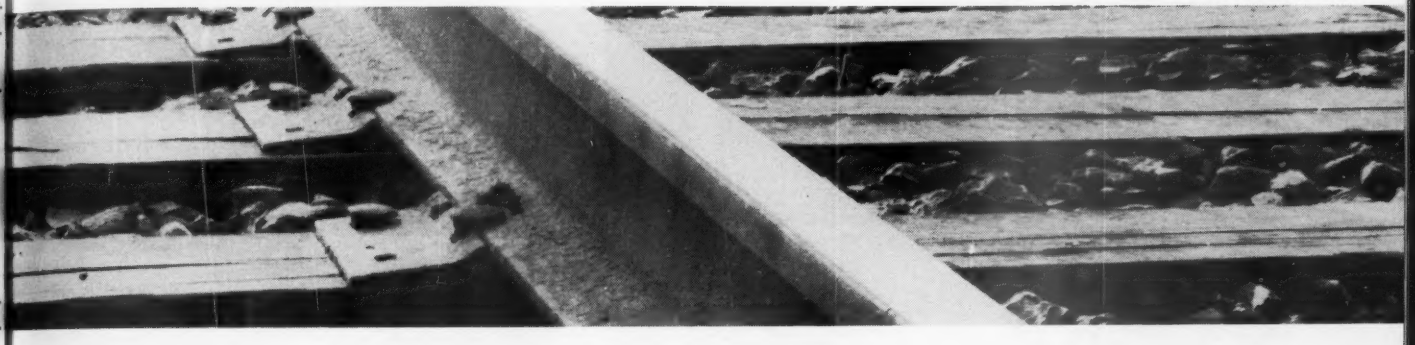
The issue arose when the highway department advertised for bids for the construction of certain projects, including the requirement that the construction contractor bidders perform engineering and surveying duties normally and traditionally executed by professional employees of the highway department. The Ohio Society said it understood the change was made because of the fear on the part of the highway department that it would be unable to employ sufficient engineering and surveying personnel properly to supervise the construction of the projects. OSPE pledged its aid to help the Director recruit properly qualified engineering personnel to supervise the construction of highway projects and to establish adequate and proper salary schedules for the professional employees of the department.

Highway Director S. O. Linzell replied, however, that the legal point had been considered and that he was without doubt as to the appropriateness of the practice. He declared that the procedure was made imperative because of emergency conditions, but "hoped" that it would not be necessarily continuous.



# THE "GAME" THAT NEEDS PROFESSIONAL ENGINEERS

By JAMES M. SYMES,
*President, The Pennsylvania Railroad Company*



Of all industries and businesses, railroading more often than any other is described enthusiastically as a "game." It is a large-scale type of "game," played with big and expensive counters, and the men whom we need on our team in great proportion are the professional engineers. As a matter of fact, the future of this great industry represents a real challenge to and is in large part the responsibility of the engineer.

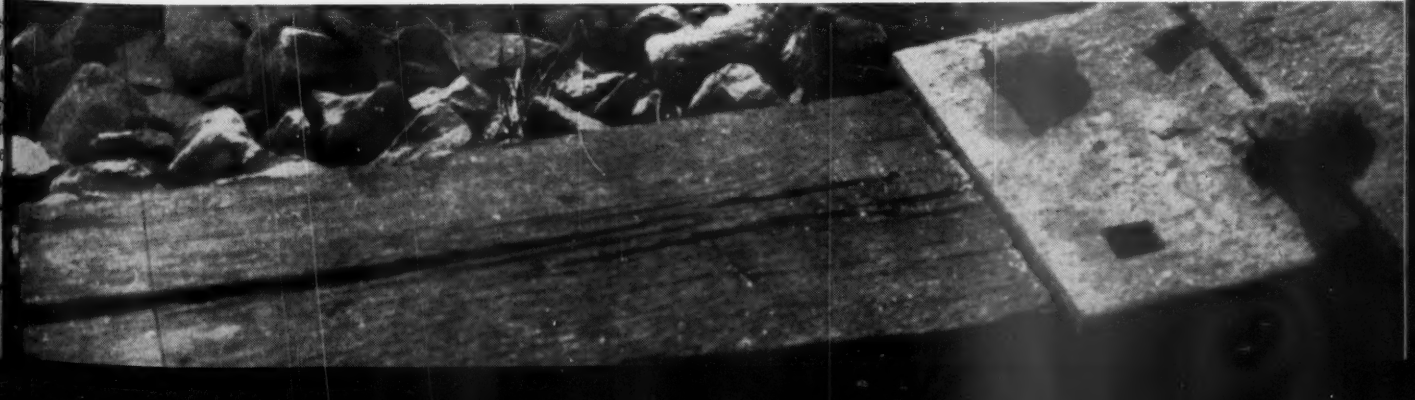
Railroads have constituted one of the most potent factors contributing to the phenomenal growth of the United States. They have helped to make the country the industrial giant that it is today. To my mind there is no field that offers greater opportunity for giving public service and gaining stimulating and invaluable experience than this one.

I am not an engineer myself, but I am very glad to have so many competent and well-trained engineers working with me. They bring a unique approach to the problems of modern transportation that is of immense value, far transcending the realm of the purely technical.

The Pennsylvania Railroad has always had a high regard for the professional engineer—and no hesitancy whatsoever about confronting him with difficult challenges. In our 107 years in business we have had thirteen presidents—ten of them engineers. We have today eleven vice presidents: eight of them are engineers. All our general managers are engineers; so are most of their assistants. We have in all over a thousand graduate engineers on our railroad team—and each year we search the colleges and technical schools for more.

But before going further into my subject, I should point out two limiting factors. The first is that no man can be sure he knows the future pattern of *any* industry—especially one that has already gone through such distinct phases as the railroad industry has. This means that the most he can do is *speculate*—or, as it is the fashion to say nowadays, "make an educated guess."

The other and less obvious limitation is that the individual railroad man's thinking will tend to be in terms of his own particular road and roads like it. For, though the general public may not be aware of the fact, there are many kinds and varieties of railroads. Nor is



# *Railroad Improvements Cost Money—and Lots of It!*

the difference among them a mere matter of size. Some offer a great deal of passenger service; some offer little or none. Again, there is considerable variation in *kind* of passenger service offered. Some roads render a great deal of commuter service; others, little or none. In a few cases this commuter service comes close to paying its own way; in most it operates at considerable loss. There is, too, wide variation in intercity passenger service. In some parts of the country the cities are far apart, making the average ride longer and therefore productive of more revenue than in parts of the country where cities are close together. To increase the variety, some railroads serve both types of areas.

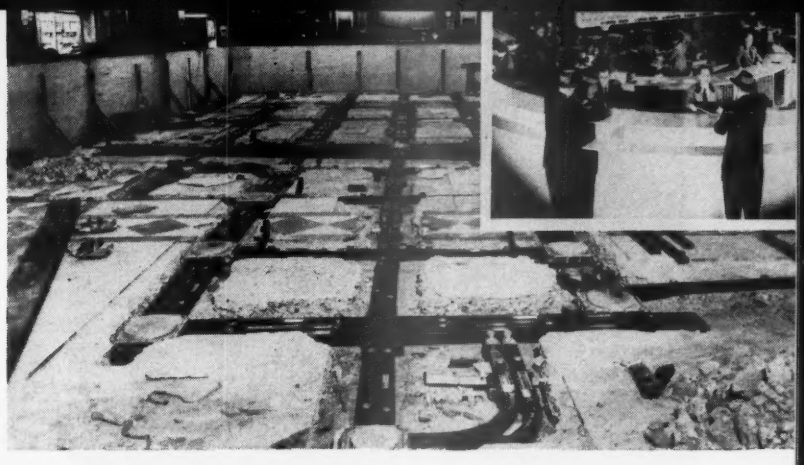
There are even greater variations in freight service. In highly industrialized areas the shippers and receivers are necessarily closer together than in less industrialized areas. This means more short hauls, more terminal yards and more switching. Again, some railroads serve only one type of area, and some serve both. There is, too, a wide variety in respect to types of freight handled. Some railroads derive nearly all of their revenue from such bulk commodities as coal, ore and steel. Others deal heavily with farm or forest products; still others get most of their revenue from hauling manufactured products. Still other railroads handle all these types of freight, and more too numerous to name in this piece.

So you can see why, in contemplating the role of the professional engineer in the future of railroading, an individual railroader necessarily does most of his thinking in terms of his own road and of roads pretty much like it. With that clear, it might be useful to sketch in a few words what kind of railroad the Pennsylvania is:

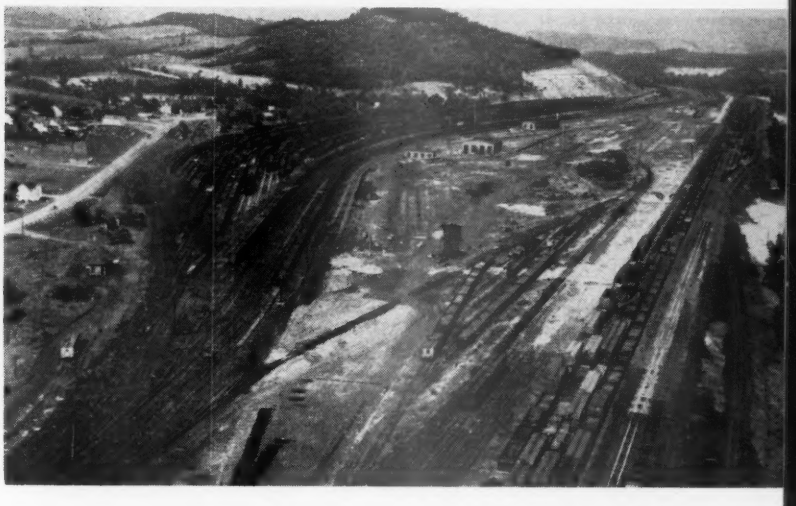
The Pennsylvania operates some 10,000 miles of road, which makes it one of the longest in the country. It is also one of the most varied. There are four heavily-used "arterial lines"—Washington to New York, Philadelphia to Pittsburgh, Pittsburgh to Chicago, and Pittsburgh to St. Louis. These four arteries and their considerable network of branches serve a total of 13 States and the District of Columbia, including direct service to eight of the Nation's ten largest cities. Some of the branches would make sizable railroads in themselves: the one connecting Fort Wayne and Mackinaw City, for instance, is as long as from Philadelphia to Boston.

The traffic is both freight and passenger: in 1953 revenues from freight service were $819,000,000 and from passenger service (which includes mail, express and dining car) $214,000,000. The area served is both

▲ **These parallel endless belts, each 1,600 feet long, carry ore from the Pennsylvania Railroad's new $9,000,000 ore pier in Philadelphia harbor. The pier itself is 850 feet long and 76 feet wide; has two unloading machines capable of handling eleven to twelve hundred tons an hour apiece.**



**Above: "Wiring for electronic wizardry" is what Pennsylvania Railroad spokesmen call this installation at their new Pittsburgh Ticket Sales and Service Bureau, shown in insert. The railroad's professional engineers installed underfloor electrical raceway systems to provide conductors for all the bureau's power and communication apparatus. Below: Site of the Pennsylvania Railroad's great new freight car repair shop under construction at Hollidaysburg, Pa., at a cost of approximately $12,000,000. The half-mile-long shop building will be located near the center of the Hollidaysburg freight yard.**



◀ **An integrated truck service helps the Pennsylvania speed its freight service by prompt pickup and delivery in "zone" cities. Trucks also replace way freights in handling LCL shipments to smaller communities within its 132 "zone" station areas.**

agricultural and industrial, with the emphasis on industry. Our largest industrial customer is the steel industry, for which we handle very great quantities of coal, ore, fluxing stone, scrap and manufactured products. Passenger service includes such well-known trains as the Broadway Limited, the "Spirit of St. Louis" and The Congressionals. There is for these days considerable commuter service around Philadelphia and New York.

In sum, it can be said that the Pennsylvania offers practically every type of railroad service there is—and has in one form or another practically every railroad problem there is. Some of these will be mentioned here; meanwhile the engineer may be sure that, on the Pennsylvania, he will not lack for a variety of problems, both present and future, to challenge his talents.

Nor will he, as already indicated, lack for physical plant to work with. The 10,000 miles of road is just the beginning: there are also vast and complicated signalling, switching and communication systems; no end of passenger and freight terminals, bridges and tunnels; considerable marine equipment, and an almost endless array of locomotives and other rolling stock. It all adds up, when you include cash, materials and supplies, to an investment of nearly 3 billion dollars, or well over $25,000 per employee.

And now to some of the industry's problems as they confront the engineer:

We can best start, I think, with the fact that the railroads are already built. Their far-flung network covers the length and breadth of the Nation, reaching practically every area that needs and can use their services. The building of this network took over a century and required the best engineering talent the country possessed. It meant tunneling hills and mountains, bridging valleys and gorges and marshlands, negotiating rivers and streams—conquering just about every "roadblock" that Mother Nature can think up. That part of the job is now done: pioneering construction into new areas is just about over. But that does not mean that the engineer's work is over: far from it. For, having constructed this giant plant, *he must now help management keep it vigorously alive and active in the face of economic changes and pressures that confront it.* Nor can he do this simply by dutifully following orders: *he must take the initiative of educating management to give him the right orders.* He must, in short, "educate his boss"—and for the sake of the industry's future he had better educate him right. Take for instance this situation:

Most railroads were laid out and built decades ago. Many of them, or at least parts of them, were built when

**Upon this Pennsylvania Railroad professional engineer rests many responsibilities. He figures prominently in the organization's programs for progress.**

traffic and operating patterns were far different from those that exist today. Competition by highway, airway and waterway has drastically changed the pattern of traffic. Technological improvements—electrification, diesels, better signalling systems, and so on—have drastically changed the pattern of operations. Generally speaking, greater use is now being made of the main lines of railroads, and less use made of the side and branch lines. Perhaps superior main line service has been partly responsible for this change: in any event the change is here and it propounds a difficult problem. In the face of this changed situation, how can we get *more, and more expertly-placed, work out of our new technologically-improved tools of transportation?* How can we make them provide still better service in areas where there has been or is going to be traffic growth, while making a smaller allotment of these tools maintain good service in areas where there has been or will probably be traffic decline? Let me give you an example:

AMONG our railroad's many branch lines is a very long one that was built years ago to take care of a substantial passenger business and considerable freight business. The passenger business was largely resort travel; the freight business was mostly lumber, with some agricultural products. The branch (an independent railroad when constructed) was laid out and built to serve and still further develop the area. It is nearly 300 miles long; most of it single track.

But what has happened over the years? The lumber has been worked out; the agricultural products are now moving to nearby metropolitan areas by truck; the automobile and the airplane have taken nearly all of the passenger business. Meanwhile, there has not been sufficient industrial development in the area to build up new sources of freight. In the old days, with a rather heavy density of short passenger and freight trains, it required many facilities to operate this line—but most of them are not needed with today's lower volume of business and ability to operate longer passenger and freight trains.

So what do we now need on this 300-mile branch line to meet present-day requirements? A few diesel locomotives, replacing the once rather large steam fleet, have made engine terminals, coal docks and water stations unnecessary. Some of the once numerous stations are not needed, and with automobile and truck transportation available, stations can be spaced much farther apart. With longer trains and less density, some passing sidings are being eliminated; the same is true of intermediate yards. Mechanization of track maintenance, replacing manual labor, has helped make this work less costly. Thus, with the lighter volume of traffic, proper "shrinking" of facilities to take care of present conditions is essential if this branch is to operate at a profit. Even a slight profit, when you consider the traffic feeder value to the main lines, could make this branch and others like it of real value to our railroad as a whole.

It's not hard to see how the professional engineer, planning and acting in terms of the techniques and economics of railroad transportation, can be of tremendous help with that typical and widespread problem of present-day railroading. And now let's consider another widespread problem raised by the exact opposite of the above situation: *growth of traffic beyond the apparent capacity of present facilities to handle it.*

WE have, fortunately, a good many miles of line where it is difficult to handle the traffic that has grown up along them—a growth, by the way, that we aggressively stimulate by encouraging factories and other industrial installations to locate near our tracks. The natural human reaction to such a pleasant situation hardly needs mentioning: "What, more business than our present four tracks can handle, and still more in sight? Well, what are we waiting for? Let's lay a fifth track, and maybe a sixth."

But such building costs money—a very great deal of money. And railroads cannot, like waterway or highway or airport builders, turn to Federal, State, county and/or city governments for this money or for tax-exemption help in getting it. The railroads must put up the money themselves—after first borrowing it, most likely—and must in addition pay taxes on the new facilities, something that waterways, highways and mighty few airports do. So extensive building is not likely to be the answer. But there is an answer all the same—and here is where the engineer comes in.

He can show us, in each instance, how we can get even more work than we are already getting out of the technological improvements he has given us—the diesels that haul longer trains faster, thus relieving track occupancy—the better signalling and switching systems that permit more interchange—the mechanized classification yards that speed up yard work, that traditional consumer of time and money—and dozens of other improvements ranging from better rail to more efficient and productive freight cars. We are, it is true, already getting a good deal of advantage from these various advances; today a given amount of facilities and equipment can handle assignments the same amount could not have touched a few years ago. But we need, both on our big-volume main lines and on our branches and side lines, to make still further advances.

Naturally, these alterations of branch and main lines require a great deal of research and thinking that is both "economics" and "engineering"—what might be called "engineering economics." This requires decisions that are both broad and detailed. For instance, in replacing two or more freight stations or shops or classification yards or other facilities by a centralized single facility, much thought must go to locating the centralized facility both in terms of handling present activity

efficiently, and of capacity to handle a possible future increase of activity. This means drawing the line, which is often a fine one, between uneconomic over-building and equally uneconomic under-building.

It also raises a multitude of important questions of economic engineering detail, many of which the professional engineer recognizes at once as questions of first cost as against maintenance expense. In planning a new shop or pier building, for instance, what consideration should be given to siding the building with aluminum sheet, asphalt-coated steel, or one of the new plastic materials? In consolidating several classification yards into one, which is more economic: traditional bolted track, with its lower first cost, or continuous welded rail, which is easier and cheaper to maintain? In laying new line, or in maintaining line already laid, which is the more economic type of tie plate—plain carbon steel, with its lower first cost, or copper-bearing steel with its better corrosion resistance? Should tie-spacing bars on new or rebuilt bridges be wrought iron, copper-bearing steel, or one of the new low-alloy steels? Should the bridge itself be of welded, bolted, or riveted construction? What thought should be given to pre-stressed concrete construction, a technique now being explored in railroad bridge building?

NEEDLESS to say, such decisions involving first cost as against maintenance are not easily made, for the industry spends hundreds of millions of dollars a year in construction and maintenance, and can afford mighty few economically unfortunate decisions. And it is the engineer who in the last analysis must provide the decisions.

So far I have mentioned only what you might call *in-plant* matters—problems in our own back yard on which the engineer can guide and help us. But railroads—and their engineers—cannot keep off to themselves. They must cooperate with other industries and with the communities they serve. I have already mentioned the activity of railroads in attracting factories and plants to locations on their lines. As that is successful, it benefits both the railroad and the incoming industry: it generates business activity, payrolls and tax base for the community. An example of more purely industrial cooperation is the railroad leadership in exploring on a large scale the possibility of moving a great deal of intercity freight by trailer-on-flatcar service. Under this system, loaded trailers would come to the rail terminal by highway, come aboard special flatcars for the journey to the rail terminal nearest their destination, and proceed the rest of the way by highway. This should benefit a good many communities—and the motoring fraternity in general—by getting a lot of massive vehicles off the public road and onto the steel "highways" that were specifically built for such work. We don't know yet how far this movement will go. Some railroads already offer it on parts of their line; as soon as permitted by the Interstate Commerce Commission, we expect to inaugurate it on the Pennsylvania Railroad between New York, Philadelphia, Pittsburgh and Chicago. Later, as the opportunity develops, we expect to extend the service to other cities. Needless to say, engineers are playing a considerable part in this project, both in matters of technique and equipment and of economics.

Finally, and as an example of railroad-community cooperation of special concern to engineers, I should like to mention the Pennsylvania Railroad's "Penn Center" development in Philadelphia. Back in the 1920's, the railroad and the city worked out a plan by which our Broad Street Station and the blocks-long "Chinese Wall"

**A new PRR electric freight locomotive employing the first successful application of the ignition rectifier, an electronic principle used to convert current.**

stone-and-brick structure that carried trains to and from it could be eliminated, thus freeing for modern development some 15 acres right in the heart of the city. In accord with the master plan, we built our Suburban Station to handle our suburban trains underground, and our Pennsylvania-30th Street Station on the far bank of the Schuylkill River to handle our intercity trains. The depression and then World War II intervened, halting the project before demolition of the old station and its "Chinese Wall" could begin. Now the area is cleared and building on it is underway. As you may suppose, we had plenty of opportunity to dispose of this land at "attractive" prices—and with no control over the uses to which it might be put.

"Penn Center" may seem a far cry from a discussion of the role of the professional engineer in railroading. The fact is, however, that such things are very much part of the railroad picture, both present and future. Few indeed are the major American communities that railroads did not help build to their present importance both by civic-minded cooperation and by offering economical, efficient, easy-to-use transportation. That has been the pattern for well over a century. Thanks to the engineer's present and future contribution, it is likely still to be the pattern a century hence.—***End.***

## *About the Author . . .*

**Mr. Symes**

James Miller Symes, who became president of the Pennsylvania Railroad Company on June 1 of this year, has been with the railroad since 1916 when he started out as a clerk in the train master's office in Pittsburgh. Since then he has advanced through various positions with the company, serving in Cleveland, Chicago, Washington, D. C. and Philadelphia, as well as in Pittsburgh. Immediately prior to his election as president, he held the position of executive vice president in the road's Philadelphia office.

A native of Glen Osborne, Pa., Mr. Symes acquired his early schooling in Sewickley, Pa.

He is also a director of the Pennsylvania Railroad and its several subsidiary companies.

***Editor's Note:*** **The author of this somewhat alarming article has had wide experience in industry both here and abroad. The material he discusses has been gleaned from this first hand knowledge of the situation although, for obvious reasons, some of his sources of information cannot be divulged at this time.**

# Engineering and Industrial Development in the U.S.S.R.

**By J. D. A. Morrow, President,**
***Joy Manufacturing Company,***
**Pittsburgh, Pa.**

THE subject of this article is of blazing importance to the people of this country. The tremendous engineering, scientific, and industrial effort of the U.S.S.R. is profoundly affecting our way of life. Its immediate purpose is the conquest of the world. On this point, there should be no misunderstanding or misconception whatever. The Soviets openly state that they are determined to dominate the world. They make no secret of that goal. On the contrary, they proclaim it vociferously and repeat it endlessly. Further, they state that the accomplishment of this purpose involves the destruction of the capitalistic nations, of which we are the leader and therefore their great enemy. The power of the United States is the chief obstacle to the easy accomplishment of their ends. We, therefore, are the first target for destruction. It is against that background of purpose that we examine the engineering and industrial development that is going on in Soviet Russia.

In the main, everything reported here comes from authoritative published sources available to anyone who will take the trouble to get them and study them. The data thus obtained are supplemented by information that we receive from our representatives who do business in 71 countries of the world outside the Soviet Bloc. This information is still further supplemented most valuably by foreign manufacturers and engineering companies with whom we have regular dealings and friendly relations and whose officials, through personal contacts and visits, are more intimately informed of what is going on behind the Iron Curtain than are we.

Many Americans apparently have the impression that, outside the very top Soviet high command, the inhabitants of the Soviet Union are on a basis of equality, with respect to standards of living and opportunities for advancement. That impression is completely false. In fact, there are vast and intentional differences in the status of great segments of the Soviet population. Entire areas of population are ruthlessly exploited for the benefit of others. The agricultural workers are an example. Prices for their products have been steadily cut, their incomes reduced, and their standards of living mercilessly lowered, in order that city dwellers may have cheaper food. Cities are the "hot beds" of revolution, not the scattered people of the countryside. Consequently, city dwellers are deliberately favored. The urban population is now estimated to total 86,000,000, or over 40 per cent of the estimated total of 213,000,000. Moreover, the urban population is growing much more rapidly than the rural, 40 per cent since 1940 compared to 13 per cent for the country, a natural result of increased industrialization.*

*Dr. Demetri B. Shimkin, National Industrial Conference Board.

This is a 1940 photo of a sheet steel plant in Zaporozhie in the Ukraine. Recent industrial pictures are not available, but at the time this plant was billed as "receiving its power from the hydro-electric plant of the famous Dnieper Dam," and as being "one of the largest metallurgical organizations in Europe."

THE key to Soviet industrial development is, of course, their engineering and scientific base for such expansion. A paragraph or two, first, about the Soviet educational system is therefore pertinent.

Immediately after the Bolshevik Revolution, college students swarmed out of their classrooms shouting, "We're free, no more examinations!" Professors and instructors who tried to maintain the old scholastic standards soon disappeared. Presently, however, the Soviet leaders discovered that while young Bolshevik students under that system might make good party members, they were worthless as engineers and scientists. The present system was then inaugurated.

The Soviet educational system is planned and administered to accomplish specific purposes of Soviet ideology. It is highly effective for that purpose. The children of agricultural workers leave school at the end of the fourth grade and go to work. Any higher education is denied them, but for the rest of the Soviet youth, the educational system is highly competitive. Beginning at high school, it constantly skims off the cream of each class for further educational advancement. More and more schools of higher learning are being built and staffed. A certain number of high school graduates are predetermined on the basis of the educational and training capacity of these schools of higher education. Students for further education are selected from the high school graduates by searching examinations. The same procedure prevails through college. The result is that the brightest and best students are the ones that advance to the highest levels of learning.

Soviet professors, instructors, and teachers are dazzlingly well paid: University professors, for example, are among the highest paid wage earners in Russia, ranging anywhere from $18,000 to $36,000 per year and ranking with full generals and marshals of the army and major successful industrial executives who exceed their production quotas.*

Instruction is modelled on German methods and is strong on basic fundamentals. The requirements for the Soviet equivalent of our B.S. and M.A. degrees are generally more rigorous than ours here and a Russian doctorate in engineering or chemistry, for example, represents a definitely higher level of scholarship than in the United States.

After a time, the Soviet leaders discovered that while their educational system, measured by laboratory and experimental results, produced some very fine scientists and engineers, they were not getting their discoveries and inventions applied in industrial developments. They went to work immediately to correct this weakness in the educational system. The Soviet leaders knew what they wanted. They coined a pair of vividly descriptive words for what they needed: "Amerikanizatsiya" and "Fordizatsiya." That is, Americanize their scientific and engineering education in its application to the needs of Soviet industry. Incidentally, both words have been taboo in Russia for some years now.

To make the education and training of their engineers and scientists more practical, they have established many special schools that follow the system employed by Antioch College, the University of Cincinnati, and similar American institutions. Thus, in the industrial complex of Karaganda in Kazakhstan, the students in such schools are part-time classroom and laboratory workers and part-time workers in mines, factories, steel mills, and industrial establishments, observing and learning to apply practically what they have been taught in the schoolroom. Hundreds of these schools are now scattered throughout Soviet Russia, teaching the students "Amerikanizatsiya."

This is a view of the recently-built Moscow University skyscraper structure with a red star atop the tower. The author of this article warns that "it appears that the Soviet technical and scientific educational system is turning out an exceptionally intelligent and highly educated group of engineers and scientists at a faster rate than we . . ."

THE Rector of Moscow University, I. G. Petrovskiv, in one of the most recent issues of the Russian journal, "Science and Life," states that at the present time there are 890 college-grade schools in the U.S.S.R. with 1,500,000 students. From these schools in the past school year, over 200,000 men and women were graduated. Only 19,000 were from the universities. The remainder came from the specialized schools. Thus, specialized education applies to 90 per cent of the Russian college students.

Further, Dr. Demitri B. Shimkin, of the Russian Research Center and the United States Census Bureau, estimates that, of the students graduated in Russia last year,

*Collier's Magazine*, p. 95, No. 5, Vol. 133, March 5, 1954.

**A view in the Siemienowice Mine in Upper Silesia, Poland. With the help of machines such as this, Polish mines are expected to produce more coal in 1954 than Belgium, Italy and France together. Output in 1953 was almost 90,000,000 tons; the goal for 1955, final year of the current Six Year Plan, is 100,000,000 tons.**

approximately 50,000 were engineers. In contrast, our 1,327 college-grade schools, with an enrollment in 1952 of 2,150,000 students, granted degrees to 403,000 graduates, of which number only 30,380 were engineers. Thus, it appears that the Soviet technical and scientific educational system is turning out an exceptionally intelligent and highly educated group of engineers and scientists at a faster rate than we are training their opposite numbers in the United States, that the Soviet graduates represent a higher level of scholarship than do ours, and, further, that the Russian graduates are better and better able to translate their new discoveries and inventions into practical commercial processes and machines, intended to work the will of the Soviet rulers upon the world.

Respecting invention in the U.S.S.R., Dr. J. G. Tolpin, Editor, Foreign Literature, Development and Patent Department of the Standard Oil Company of Indiana, says: "It is the official policy of the Soviet Government to encourage inventive activity by all means, including patent protection." The Soviet patent law provides, first, for "author's certificates" and for "patents." The inventor may apply for either. Only inventions suitable for industrial utilization are patentable by either method.

An author's certificate automatically gives the state the right to use the invention for remuneration determined by the state. A patent confers upon the inventor an exclusive right to his invention for 15 years, but if the discovery or invention is deemed of sufficient importance, it may be taken over by the state and kept secret upon payment of appropriate remuneration to the inventor.

The amount of remuneration allowed an inventor depends upon the technical significance of the invention and its economic value to the U.S.S.R., but may be quite substantial. Earnings from inventions and technical improvements up to 10,000 rubles are exempt from income tax. Further, inventors are given preference in applying for positions in research institutions and the patent or author's certificate rights can be inherited. Thousands of author's certificates and patents have been granted.

The U.S.S.R. is not a member of the International Patent Convention. Non-Soviet citizens, however, are accorded rights under Soviet law similar to those enjoyed by citizens of the U.S.S.R., provided there is reciprocity between the two countries with respect to patents. Author's certificates are not issued to foreigners. Our patent attorneys advise me that so far as Americans are concerned, although there is theoretical reciprocity, these provisions are practically non-operative.

Within the U.S.S.R. there are many technical and scientific publications regularly printed and issued to which Russian engineers and scientists can subscribe. In some fields, their publications, particularly in mathematics, are more numerous, detailed, and frequent than American publications in similar fields. There is, therefore, a rich flow of information among Soviet engineers and scientists respecting their own investigations, experiments, and results.

Until 1950, practically all Soviet scientific journals and a large number of technical magazines could be subscribed to at the Soviet Book Store in New York, and the issues arrived here regularly. Secret research in fields such as nuclear engineering, electronics, etc., of course, is not detailed in such journals in Russia any more than it is in the United States, but, at least until recently, American officials applied secrecy more widely than did Soviet officials. However, since 1950, more and more Russian technical and scientific publications have been withdrawn from foreign subscriptions.

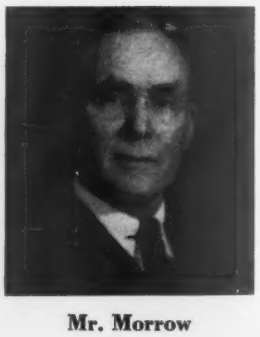
The life of an engineer or scientist in Russia has its special hazards. Engineers who develop successful new machines may be rewarded with a Stalin Prize. Their names appear in *Pravda* and in *Isvestia*, but if the machine does not work, they may be given three days to make it work or else. There have been so many "or else" cases, in which ambitious engineers or scientists suddenly and permanently vanished, that there is a definite tendency on the part of Soviet engineers to seek security first.

Consequently, today nearly 55 per cent of the educated engineers of Soviet Russia have found the "shelter" of administrative jobs, inspectors, checkers, and other management positions in the vast, complicated machine of supervision that burdens Soviet industry.

Here it is desirable to emphasize the importance in the Soviet regime of the competitive element. Most Americans think it is entirely absent from the Soviet theory of labor. On the contrary, it is more ruthlessly applied in Soviet life than anything that our free enterprise system presents. In the U.S.S.R. the chief function of the government-controlled labor unions is to set norms of

(*Continued on page* 37)

## *About the Author . . .*



**Mr. Morrow**

**J. D. A. Morrow, left, the author of this article and president of the internationally-known Joy Manufacturing Company of Pittsburgh, has long been identified with the coal industry in the United States. During the course of his career he has held numerous other executive positions including the presidency of the Pittsburgh Coal Company.**

▲ **The South is home for a vast petroleum industry employing thousands of engineers. Above is the Esso Standard Oil Refinery at Baton Rouge, La.**

**Here is still another good example of thriving industry in the South. Shown is a Kaiser Aluminum plant where bauxite ore is converted to alumina.** ▶

*Here's Why*

# Southern Engineers Are Staying Home!

## The Chief Reason Lies in the Continuing Swing to Industry That Is Revitalizing the South.

THAT dignified gentleman—as much a prototype of the old South as the crinoline-skirted Southern belle—who used to survey his dwindling plantation acreage from his white-columned portico while shaking his head over the fact that his headstrong eldest son had gone North to study and stayed there, is no longer wistfully harking back to the past. His youngest sons—graduate engineers—are planning to remain at home. And he himself is right in the middle of the new drive to "balance agriculture with industry"—the program that they call BAWI in Mississippi and which, in one form or another in every state, has become the goal and watchword of the modern South.

It is no secret that for the past ten to twelve years a real economic revolution has been taking place in the Land of Cotton. The full import of this revolution was brought home most forcefully to the National Society of Professional Engineers as a result of a recent income and salary survey of its members. Those commanding the highest earnings were found to be in the New England and Middle Atlantic States, where the median income figure was determined to be $8,630. Next came the Midwest with a $7,710 median; and then, very close to the midwestern figure, was the $7,500 median for the professional engineers in the Southeastern States.

The statistics for the upper decile were even more interesting because in that bracket, while the highest-paid engineers in the Midwest earned at least $16,680, the decile figure for the South was $17,460, second in line to the New England-Middle Atlantic upper tenth figure of $18,530.

First of all, this obviously indicates that industry is no longer a stepchild down South since the majority of engineers are employed in the industrial field. In order, however, to pinpoint some of the salient factors behind this very interesting income data, the AMERICAN ENGINEER has made a spot survey of a number of the participants in the industrial revival that means greater opportunity for the engineer in the South.

Among those at the forefront, of course, are the power and utilities companies, such as The Southern Company of Birmingham, Alabama, with its four associated operating companies—the Alabama Power Company, the Georgia Power Company, the Mississippi Power Company, and the Gulf Power Company, which latter serves northwest Florida. It is good business for the power companies

to encourage industry to move into their areas, and it is good citizenship, too, in the drive to revitalize the South.

Then there are the Chambers of Commerce, both state and local, the "Committees of 100," the various industrial development boards, the banks, the transportation and communications industries whose efforts considerably expedite the industrial upsurge and for which the revival is, in turn, a real boon, and the people themselves who thoroughly approve what industry is doing for their resource-rich area.

They are more than eager to extend the traditional hand of southern hospitality to the industrial giants moving into the area, which include, to cite only a few—the Crane Company's subsidiary, Cramet, Inc., and the Koehring Southern Company in Chattanooga, Tennessee; General Electric in Roanoke and Waynesboro, Virginia, Rome, Georgia and Anniston, Alabama; Eastman Kodak near Atlanta; Kaiser Aluminum and Chemical in New Orleans; Aluminum Company of America in Bauxite, Arkansas, and Alcoa, Tennessee; Johns-Manville in Natchez, Mississippi; Western Electric in Winston-Salem, Burlington, and Greensboro, North Carolina; Westinghouse Electric near Raleigh, North Carolina, and in Reform, Alabama; American Cyanamid in Columbia, South Carolina; DuPont in Camden, South Carolina, and many, many more. In recent years the South has been adding an average of approximately one new multi-million-dollar manufacturing plant per day.

THE South has minerals, coal, petroleum, natural gas, phosphates, forests, water, and—most important—manpower (approximately 30 per cent of the total population of the country), all desirable for an integrated economy. Its resources are particularly well-suited to the rapidly growing synthetic fiber industry, which has become an almost exclusively southern development, one of the most recent additions to the fiber-manufacturing field being The Chemstrand Corporation's gigantic nylon plant in Pensacola, Florida, which has an initial rated capacity of 50,000,000 pounds of nylon filament yarn per year.

Then there are the petroleum and petro-chemical industries which are enjoying phenomenal growth, particularly in the New Orleans, Baton Rouge, and Lake Charles areas in Louisiana. The paper and chemical industries have moved into northwest Florida with such big names represented as Arizona Chemical, Armstrong Cork, Escambia Treating Company, and the St. Regis Paper Company. The electronics industry has found fertile fields for development in both Virginia and North Carolina.

Port facilities have influenced and been influenced by stepped-up industrialization from Norfolk, Virginia, to the tip of Florida and around the Gulf to Mobile and New Orleans. And many claim to see a new future for the somewhat faltering shipbuilding industry.

Eighty-three new industries, located in 43 different cities and representing an investment total of well over $30-million, is the record established in Alabama during the past year. Since 1945, South Carolina has added around 990 new plants and expanded 1,100 others.

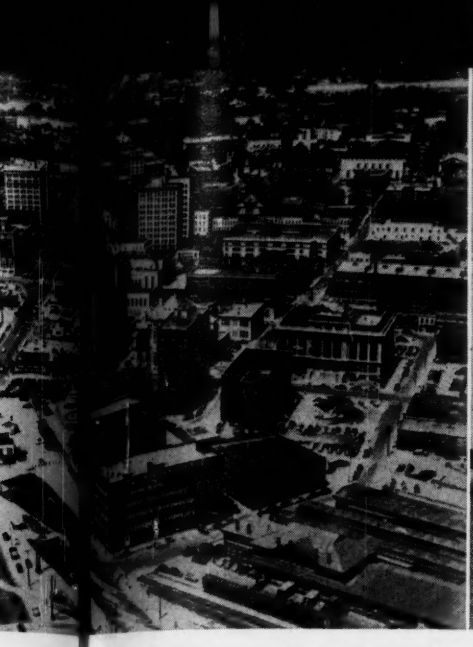
Kentucky, which was included with the Midwestern region in the Professional Engineers' income survey but which is nevertheless considered as a part of the industrial revival area, has welcomed such famous names as B. F. Goodrich, Penn Salt, Pittsburgh Metallurgical, International Harvester, Sylvania Electric, and Corning Glass to its industrial family. Since 1949, 550 major plants with an estimated plant investment of $2,320,000,000 have located in the state, which had ranked fourth in the nation in the value of manufactured goods produced in the early part of the 19th century but which had slipped into a marked decline industry-wise until the impact of two world wars jolted its economy onto the upward path.

All of this means that the engineer is quite the man of the hour down South. What is more, as Dean Leo J. Lassalle of the Louisiana State University School of Engineering has pointed out, there is a definite trend towards new graduates in the engineering field staying in the area where there is a surplus of good engineering jobs, and where southern industry is coming more and more to depend "on what we can turn out" when it comes to technological experts.

An official of the Logan Company, Louisville, Kentucky, manufacturers of gravity and power conveyors, points out that "In our own case we are employing more graduate engineers than ever before. . . ."

A statement from Gladwin Plastics, Inc., of Atlanta, Georgia, which has just embarked on a new program of expansion and improvement, announces that: "Recognizing that the manufacture of quality reinforced plastic products requires a combination of chemical and engineering skills, Gladwin has gone to considerable expense to get together its own group of qualified plastics engineers. This group it regards as *its investment in the future.*"

R. Y. MacIntyre, manager of the Industrial Division of



**Clockwise beginning on opposite page: A view of the young but growing Hastings Instrument Co., Hampton, Va.; many cities such as Chattanooga, Tenn. (shown) are attracting industry; an executive engineering conference at Chemstrand headquarters in Decatur, Ala.; a heavy construction scene near Atlanta, Ga.; two Chemstrand officials check a bobbin of nylon at the firm's Pensacola, Fla., plant.**

the Continental Gin Company in Birmingham, Alabama, says that: "If I were a young engineer today, I could not think of any better opportunity . . . than there is in the South."

EVEN in Florida, the land of the tourists and citrus fruit, there is a drive toward a more diversified industrial balance with its attendant greater opportunities for the engineer. The chemical and paper industries of the northwest section of the state have already been mentioned. Tampa is boasting of fourteen new industrial sites selected in the last twelve months, and engineering opportunities have also increased in the shipbuilding industry there. And in Miami, while cautioning that engineering opportunities in the city of tourists are definitely *not* comparable to those in other southern cities like Atlanta and New Orleans, Herbert S. Saffir, assistant county engineer and president of the local chapter of the Florida Society of Professional Engineers, notes that: "Area development work in the Miami area has required increasing services of civil engineers in the field of new subdivision planning and new sewage disposal system design. Present expansion of undeveloped areas in Dade County for new housing developments has required engineering work in all phases of development.

"Increasing industrialization of the Miami area will call on the services of mechanical and electrical engineers in the future. . . . "

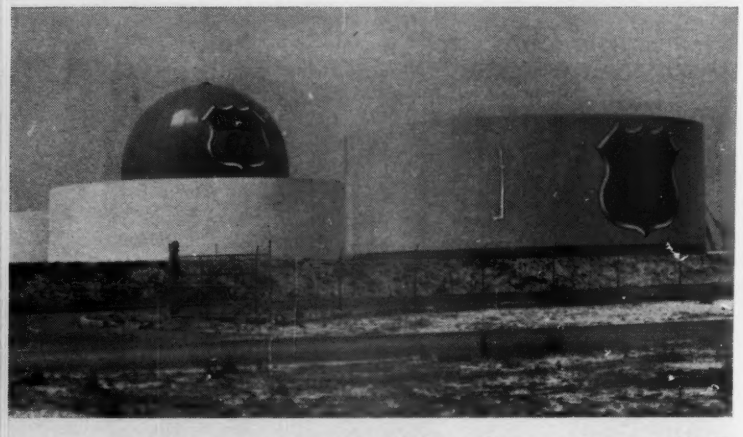
"The opportunities for engineering in industrial development work have never been greater," emphasizes James B. Gregory of the Industrial Department, Seaboard Air Line Railroad Company, Norfolk, Virginia. "Industries to a large extent are engaging consulting engineers to assist them in their investigations for new plant sites."

In addition, many Chambers of Commerce and state and local development agencies are employing engineers in various capacities in industrial development work. The City of Columbia, South Carolina, for instance, established a Planning Commission two years ago to be staffed by a planning engineer and two technical assistants. Another example is the nonprofit Duval Industrial Development Corporation formed to plan new harbor facilities and

contingent industrial expansion in the Jacksonville-Duval County area in Florida.

Elmer D. Conner, the executive director of Lousiana's Department of Commerce and Industry, reports that: "The opportunities in area development work are expanding rapidly in our State, since highways, ports, town planning, and so on, are on the increase. Opportunities for providing consulting services due to this expansion are increasing. Many of our local engineers are beginning to go into the consulting service, because heretofore much of this work has been going to groups outside the State."

In the New Orleans area alone, where during the post-war era more than $655,000,000 has been invested in new production facilities by industries establishing initial operations and by local expanding industries, the need for consultants is expected to grow proportionately with the continued growth of the five major fields of area in-



**Here is a portion of the Phillips 66 Tampa Terminal bulk plant which cost more than $1½ million, a part of the $15 million spent by the company in the Tampa, Fla. trade area during the past year.**

dustrial activity—petroleum, chemicals, petro-chemicals, steel fabricating, and food.

The young engineer in industry, too, frequently has a unique opportunity in the expanding industrial scene in that, in many instances, his chances of going right to the top down South are a good deal better than in other sections of the country. As an official of the Hastings Instrument Company of Hampton, Virginia, puts it: "A large number of southern industries are new organizations. Engineers find abundant opportunity for advancement in these young firms. Most of the companies have not reached the mammoth size at which an engineer faces the problem of being lost in the shuffle."

THE growing trend toward decentralization, toward bringing industry to the smaller communities, also is a potent factor influencing the increased industrialization of the South and, to some extent, the attitude of the engineer toward southern employment. Many companies looking for plant sites restrict their investigations to small communities of about 10,000 population. And many engineers take positions with such firms, for one reason, because they appreciate the more relaxed atmosphere found apart from the hurly-burly of congested cities.

Another significant facet of the southern economic renaissance is the fact that the South itself is becoming increasingly important as a market for its own industrial goods. As one example, a member of the executive staff of the Hastings Instrument Company remarks that: "Since the Company was incorporated in 1947, we have noticed that each year we are buying more materials and parts from southern manufacturers than in the preceding year. Supply gaps are being filled by the trend. To us, nearby sources of supply mean both quicker deliveries and lower transportation costs."

This means also that there will be many more hub cities, such as rapidly growing Jackson, Mississippi, from which industrial and other goods will fan out to meet the intense demand in the new industrial market areas. And this, in turn, is increasing the need for capable engineers trained in traffic and transportation.

In the background of the engineering employment picture, too, is a great program of technological research carried on not only by the big-name companies, but also by the independent research laboratories and the great universities of the South. A scant dozen years ago there was not one independent consulting laboratory below the Mason and Dixon line, and there was only a handful of industrial research laboratories. Today the total is in the neighborhood of 200. The Southern Research Institute of Birmingham, Alabama, to name only one such lab, is equipped to carry on work in thirteen different fields from biochemistry to process development.

AN example of the contribution of institutions of higher education to the industrial upsurge, North Carolina State College, located in Raleigh, offers a program of industrial engineering research in the ceramic, chemical, civil, diesel, electrical, geological, mechanical, metallurgical, and sanitary fields. The program is designed to integrate research activity with technical education, with particular emphasis on three areas of investigation—fundamental research, the development of new or improved processes that will provide wider utilization of the natural resources of the State, and service to industry.

This technological research—by engineers and other scientists—is also contributing to a revitalization of southern agriculture. Mechanization is becoming more and more important in the larger agricultural operations, and food processing is mushrooming into a major industry.

There are countless reasons, in addition to those detailed in this article, to account for various phases of the South's industrial boom with its contingent opportunities for engineers. There are the cost amortization plans that are particularly attractive to industries seeking southern locations. There is the increase of consumer purchasing power in the area resulting from the initial industrial surge, which means that there is an expanding market for consumer as well as strictly industrial goods. The investment capital picture is brighter than it has been since the Civil War.

Outside the purview of this article are the engineering opportunities with such defense research installations as the Oak Ridge National Laboratories, although it is no top secret that military research is also big business in many southern locales.

It is to be expected, of course, that a time of levelling-off will come in the introduction of wholly new plants; but that will undoubtedly be years away, and the splendid opportunities for engineering employment in the South should, nevertheless, remain on a high plateau far into the foreseeable future.

As an official in the Decatur, Alabama, office of The Chemstrand Corporation has put it: "No longer can any region of the United States suffer an out-of-balance economy without the conditions seriously handicapping other regions. The national economy is inextricably bound together. The South cannot help but grow. The tide is running in. Every new industrial addition swells the reservoir for the future of the people and especially engineers in this atomic age. The impact of industrialization on business is almost beyond comprehension."—**End.**

# An *American Engineer* SPECIAL REPORT

## *Re: Canadian Recognition of the Professional Engineer*

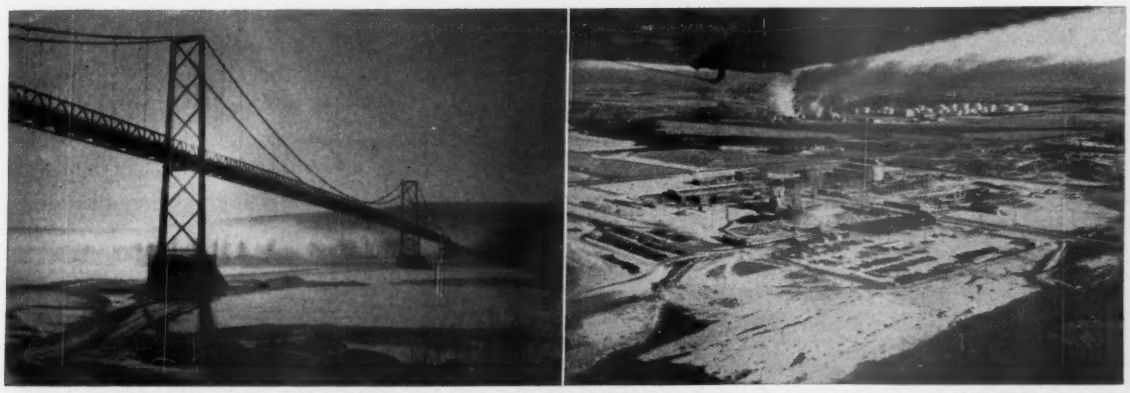
● "In Canada engineering is regarded generally as a learned profession," asserts a recent issue of the Royal Bank of Canada's Monthly Letter. "It may be said," it comments further, "that the most important single factor in our national economy in the past thirty years has been the rising influence of engineering. To go further back, the rise of our culture has been coincidental with the rise of science and technology. Because of the production advantage given by engineered factories, the worker exchanges a fraction of his waking hours for hitherto undreamed-of freedom in all other areas of life."

These two statements seem to summarize quite succinctly the Canadian attitude toward the professional engineer who is very much the man of the hour in a country whose vast natural resources are only beginning to be tapped.

The continually growing respect for and reliance on the talents of the engineer is further pointed up by the Bank's report that many small industries that never before used engineers are now finding that they can obtain better results, and meet competition more successfully, when they add professional engineers to their staffs.

There is not a province in Canada, according to the Royal Bank letter, that produces less than $20 million worth of manufactured goods annually, and there are only two that produce less than $200 million worth.

Furthermore, "when manufacturing industry recruits young engineers," says the Bank, "it is looking for potential managers. It wants men with the sense of order, the quality of accuracy, and the enterprise in getting things done that are the marks of engineering education and training.



**Above, left: The Peace River Bridge on the Alaska Highway has an over-all length of 2,267 feet with a center span of 930 feet. Right: Here is a new plastics plant in Strathcona, Alberta, an excellent example of Canadian engineering in action.**

"Engineers expend their talent largely in increasing the efficiency of others. They decrease the time consumed in making a product, thereby reducing costs so that markets can be expanded and new things introduced, with consequent increase in job opportunities. They bring about more efficient use of materials, contributing thereby to conservation of resources.

"The engineering way—of gathering all the pertinent data, subjecting it to mental and experimental test, coming to a decision, and then doing something about it—contributes tremendously to the smooth flow of productive activity, the elimination of bottlenecks, the lessening of fatigue and tension, and the building up of commercial greatness."

In Canadian Government service, too, there are many opportunities for the engineer. More than fifty per cent of the professional staff of the National Research Council and the Atomic Energy Control Board, the newsletter relates, are engineers, and approximately seventy-five per cent of their budget is devoted to applied science or engineering work; and this is only one example of the important role that Canadian engineers are playing in Government affairs.

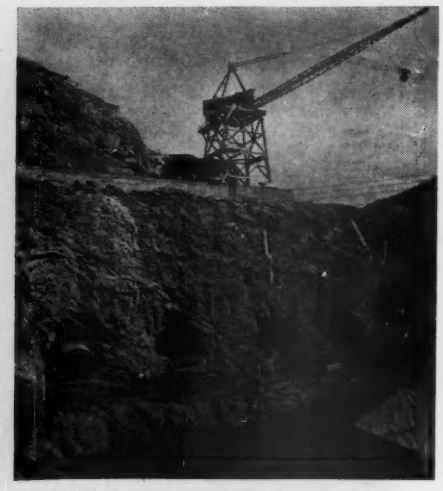
Fewer graduate engineers are leaving Canada now to seek opportunities elsewhere, notably in the United States, says the Bank. A Bureau of Statistics report shows only ten per cent of the university graduates in engineering going to the States, and in most of these cases the purpose was graduate study rather than employment. And to offset those who are leaving, information indicates that a good many more engineers from the United States are looking for opportunities in Canada. Starting salaries at the bachelor degree level in Canada compare favorably with those offered in the

(*Please turn the page*)

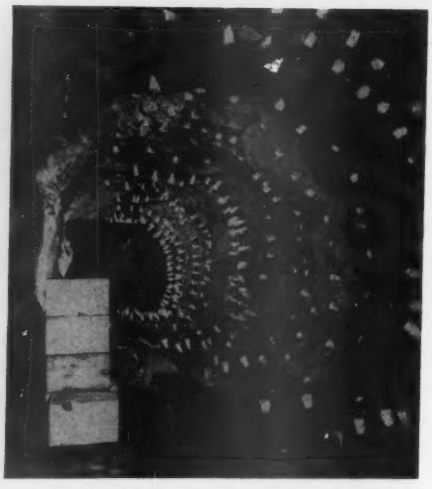
(*Continued from previous page*)

United States, according to placement officers at a number of Canadian universities, although they concede that engineers with doctoral degrees are quite frequently able to find better job offers from a financial standpoint in the U. S.

A good portion of the credit for the enhanced stature of the engineer in Canada is attributed by the Royal Bank report to the country's various professional societies. The professional associations



◄ Visible are four penstock tunnels on the construction site of the Waneta Power Plant, 13 miles south of Trail, B. C.



► More than 2,000 holes were drilled in preparation of a record 400,000-ton blast at International Nickel's Frood-Stobie Mine.

"have immeasurably raised the status of the engineer, and have protected the public from incompetence."

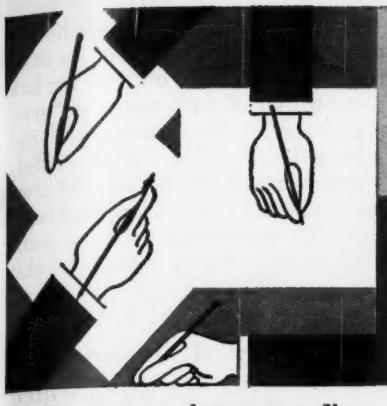
Because the provisions of the British North American Act give to the provinces the exclusive right to legislate on the practice of the professions, and because of the scope and diversity of engineering, the Royal Bank letter states that "it has not yet been found possible to have a single organization capable of catering to the economic, legal, social and technical needs of all professional engineers in Canada." But, it continues, "There are provincial associations serving our more than 20,000 professional engineers, 4,000 graduate engineers in training, and 6,000 engineering students. They have high standards which must be met before a man may call himself a professional engineer, or use the valued initials 'P. Eng.' after his name and practice engineering. The Dominion Council of Professional Engineers is the coordinating body of the provincial associations."

In addition, the report describes the Engineering Institute of Canada, the "learned society" of engineering which was organized in 1887 and now has fifty branches with 16,000 members. It is the oldest and largest of all of the Canadian engineering organizations, and it has agreements for cooperation with a considerable number of other similar professional societies in the United States and throughout the British Commonwealth of Nations.

Such is a bird's-eye survey of the esteem with which the professional engineer is viewed in Canada. "Wherever one touches engineering," the author of the newsletter points out, "one finds creativeness. An engineer may be engaged in exploratory research, uncovering new fields, setting new goals, separating good creations from useless, and drawing patterns for further work. Or the engineer may exercise his special talent in fundamental and basic research, in data-gathering and manipulation, in providing facts upon which thousands of others will work. Or he may devote his knowledge and experience to design and development, working out for everyday use the theoretical concepts of others. . . . No matter what his particular bent, the man with an engineering-type mind can find a niche fitting him perfectly."

When he finds that niche in Canada as elsewhere, the engineer takes on his shoulders a full measure of responsibility for maintaining the stature of his profession and upholding the concept of service that is basic to all true professions. The Royal Bank sums up the attitude with which the engineer is expected to meet this challenge of responsibility in the concluding paragraph of its letter as follows:

"The engineer with his heart in his work will keep the faith: the faith of his client that he will not undertake what he knows to be beyond his skill, and that in the service he gives he will be conscientious to the limit of his ability. He will keep the faith of his fellow engineers that he will remain true to his science and will base his efforts for public recognition upon acquired knowledge, scientific attainment and excellent performance. He will keep the faith of his community that he will undertake no service inconsistent with public welfare."



# Professional POSTSCRIPTS

**This is your department. Your contributions to it are solicited. We want your views on subjects that affect the engineering profession directly or indirectly. Please keep your contributions short, and remember that editing may be necessary to conserve space. Your name may be omitted if you desire.—*The Editor.***

**The subject dealing with how much engineers earn or do not earn is one that can arouse more controversy than Senator McCarthy. It is, however, a very serious problem to which a lot of good men have given much hard thought. We open —PP— this month with a piece dealing with engineers' paychecks and it was submitted by Engineer W. B. Jarzembski of Tulsa, Okla. It's all yours . . .**

**—PP—**

After reading the Professional Postscripts in the May, 1954, issue of the AMERICAN ENGINEER in which Mr. Harold H. White makes the statement, "A good engineer has no difficulty in establishing himself in our present economy; things for him in fact were never so good and there is little argument about his remuneration, if he can show ability," I cannot help but be amazed that there is such a diversity of opinion on this subject.

If someone will give me a list of well paid engineers I will gather a list of ten names, for each that he can submit, of engineers who are paid at the same level as the trades. All of us would do well to remember that the engineering profession is a profession of group action rather than individual action as the other professions such as medicine and law. In fact, I would defy any engineer as an individual to design a modern industrial process plant. He would of necessity be forced to rely on many other engineers. He should also remember that engineers, in general, are paid by relatively few projects while the other professions take a little, or lot, from a great number of projects during a year's time. When the lawyer does handle a large case involving a great deal of time he does not hesitate to take a third or half of the entire proceeds.

A successful lawyer or doctor may easily make in excess of $50,000.00 a year *practicing his profession.* The engineer who makes more than $12,000.00 annually is a very small part of the engineering fraternity and he is probably not actually practicing engineering, but is a manager for others who are. I have worked in New York, Texas, Mississippi, Oklahoma and Illinois in the past ten years and have seen civil engineers, electrical engineers, chemical engineers, utility engineers and many others. Believe me, the men actually practicing engineering do not feel that it is so easy to become established.

As a member of the NSPE and the Oklahoma SPE, I have contacted many engineers to ask them to become members of our Society. The excuse given most often for not joining is that the society has not taken the proper actions regarding improvement of the engineer's economic status. The magazine *Business Week* published an article stating that engineering is a well paid profession based on NSPE's salary survey last year. Other magazines and newspapers have published similar statements, but the engineers I talk to still do not agree.

Last month the medical profession through the AMA published an article stating that 75% of America's families owed medical bills. They didn't say so in so many words but it was implied that these were overdue bills. We all know that the wealthy men in any community are its medical doctors but they can and do make such statements. We also know from the difficulty in getting appointments that there is a shortage of doctors but does this appear in the papers, do they advertise the benefits of their profession, do they attempt to enlarge the medical schools? No, they realize that too many doctors will only lower their earnings and force them to compete with each other.

We as engineers foster the idea that engineers are in short supply, we advertise the adventure associated with engineering, we tell people that we are well paid and fat. To get interest in our organization we must convince the individual engineer that he will benefit as well as the public. After all, the free enterprise system is based on individual benefits.

**—PP—**

**Engineers should and do take a major interest in civic affairs. If this is so, the subject of fluoridation of municipal water supplies should certainly capture the thinking of PE's. Well, we know of at least one who has comment to make and he is Engineer Eugene T. Rogers of Yonkers, N. Y. Do you agree with him?**

**—PP—**

It has always been my belief that engineers should take an active interest in community affairs and that they should make use of their particular talents and training in such affairs to the end that true progress might result. However, I also feel that it is wrong for a group of engineers to endorse something until they have taken the time to make a full study of all facets of the proposal. Such an endorsement, without proper study, can only lead to an eventual public mistrust of the engineer and his works.

I refer particularly to a short article which appeared in the May issue of the AMERICAN ENGINEER in which it was stated that the La Crosse engineers (Western Chapter, Wisconsin SPE) joined in supporting a resolution approving fluoridation of the municipal water supply. I cannot conceive of any group of professional engineers endorsing such a program unless such endorsement was given purely on the basis of the recommendation of others and not on their own evaluation of the facts.

It is not my intention to question the value of fluorides in the treatment of children's teeth to prevent decay. Frankly, I am not a doctor or a dentist. However, I do seriously question the advisability of adding fluorine compounds to a water supply, in any concentration. The hucksters who are promoting this program, and who make a practice of soliciting endorsements from all manner of civic and professional groups, present only one side of the story. They do not tell their audiences that many ethical medical men have questioned the effect which fluorides may have on older people and particularly those people who are af-

flicted with any one of several chronic ailments.

The clinical data concerning the effects of dietary use of fluorine is not at all complete. That which is available casts grave doubts on the value of this program. A concentrated effort is being made by certain public health officers, at the taxpayer's expense, to promote this program. They use incomplete statistics and have also resorted to selective statistics in attempting to overcome objections. What they do not tell you, but which is admitted by every dental expert whose opinion I have been able to obtain, is that fluorides may be easily administered on an individual basis. The compounds are available at low cost for incorporation, daily, in a child's food. To me, if such treatment is indicated, it is far better to administer the medication in a measured dose so that the intake is definitely established. I have yet to find a child who drinks the same amount of water every day. It is not at all an exaggeration to say that, under the plan which is being promoted, children may vary their daily intake of fluorine by as much as four or five to one.

The proponents of the scheme to artificially fluoridate the public water systems attempt to brush aside objections by the use of ridicule. They will refer to the fact that some people do object but will then say that they are "well-intentioned but misinformed." This in spite of the fact that many of the objectors are doctors and dentists and that the American Medical Association has only given a qualified endorsement. In fact, the following appeared in the Jan. 1954 issue of the A.M.A. Journal: "With the large amount of publicity given to the relationship of fluorine in drinking water and the prevention of caries (dental decay), the much more important relationship of diet and caries is apt to be overlooked. A recent report in Australia serves as a reminder that the real solution of the problem of preventing dental caries is dietetic."

We have here a program which many people, with apparent justification, consider to be unscientific, uneconomic and of doubtful value. There is also reason, on the basis of some research, to consider that this program could cause bodily harm to some people. It is not something which should be foisted upon the public under the guise of a public health measure. It cannot be classed with the use of chlorine, as a water purifier, since its only purpose is the control of a non-contagious condition which could be more scientifically treated in other ways.

Again it is not my intention to say that fluorides should not be used when competent examination indicates their need. I do say, though, that we as engineers should not endorse this program, or any other program of doubtful value. If we are to build and maintain a reputation of integrity and scientific approach we must avoid lending our name to "causes" until we have through our own evaluation of both sides of the question, determined that the endorsement is proper.

## License Revocation At Issue In New Mexico

A test of the validity of the state engineering registration law provisions governing revocation of P.E. licenses has developed in New Mexico. The result of the challenge will be significant in determining the sufficiency of state law criteria on the point.

The test came about when the New Mexico Board of Registration revoked the licenses of two Albuquerque engineers who had been dismissed as consultants to the city on the grounds of inadequate supervision of a sewer project. The registration board action, resulting from the same incident, found the engineers guilty of "misconduct," "incompetency," and "gross negligence in the practice of professional engineering."

Upon an appeal to the District Court, Judge David Carmody ruled the law unconstitutional insofar as the revocation provisions are concerned because the broad discretion granted to the state board constituted an illegal delegation of legislative powers to the board. The jurist based his ruling on the claim that the language of the statute warranting revocation is not sufficiently defined. The court noted, however, that the problem could be easily remedied by legislation.

Judge Carmody stated that he was not passing on the merits of the case, his criticism resting only on the lack of definition of such terms as "gross negligence," "incompetency," and "misconduct." The judge noted: "every time we try a case, the court has to instruct a jury as to what negligence is. Apparently even the courts don't know, strictly speaking, what negligence is."

## *Harry A. Winne Day Is Celebrated In Cherry Valley, N. Y.*

Harry A. Winne, the recent recipient of the NSPE Award for 1954, had another honor bestowed upon him July 10th when the residents of Cherry Valley, N. Y., the village where he was born and grew up, celebrated "Harry A. Winne Day."

The day's program included a wide variety of activities from a parade and band concert to a dinner and a fireworks display. The festivities opened with the firing of an old cannon by atomic energy—a tribute to Mr. Winne's association with the development of atomic energy in the United States.

**National Council of State Boards of Engineering Examiners**—Annual Meeting. August 26-28. Hotel St. Paul, St. Paul, Minnesota.

**West Virginia Society of Professional Engineers**—Annual Meeting. August 27, 28. The Greenbrier, White Sulphur Springs, West Virginia.

**New York State Society of Professional Engineers** — Autumn Meeting. September 10, 11. Fort William Henry Hotel, Lake George Village, New York.

**Virginia Society of Professional Engineers** — Annual Meeting. October 9. Cavalier Club, Virginia Beach, Virginia.

**NSPE Fall Board Meeting**—October 15, 16. Fontenelle Hotel, Omaha, Nebraska.

**Missouri Society of Professional Engineers**—Annual Meeting. October 22, 23. Statler Hotel, St. Louis, Missouri.

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# THE ADMINISTRATIVE TRANSITION

BY PAUL H. ROBBINS, P.E.

*Executive Director*

N.S.P.E.

FOR many chapters, a change in administration takes place between June and September. The National Society revised its procedure several years ago to make its administrative change also at this time. There are a number of advantages to a transition at this time, as well as some disadvantages.

It is usual for a good many chapters to turn to lighter activities during the summer months. With the many responsibilities placed on a chapter president and the other officers, this summer respite affords a good time for them to get their chapter well organized to swing into interesting, aggressive and worthwhile professional activities as soon as fall comes. However, while perhaps the chapter as a whole enjoys a summer outing or some other type of entertaining meeting, the officers, board, and committees probably can meet several times to do important planning for the remainder of the year. Particularly is this true for the president and several key committees. The president needs to get his committee organization completely set up and encouraged to begin plans. The Program Committee should have the majority of the meetings planned by Labor Day; the Membership Committee should have its plans well laid for enlarging the chapter rolls; the Public Relations Committee should have laid groundwork for general chapter publicity and be ready for the big programming of Engineers' Week. All committees should be well integrated so that each may utilize the others' activities to better accomplish its own objectives.

One of the disadvantages of a summer transition is the psychology of vacation-time. Unless officials and committee chairmen make a determined effort to get started, it is easy to let plans ride until fall. The summer slips by quickly and several months of planning time can be lost if each, charged with some responsibility for chapter growth and strength, is not alert to the summer opportunity.

NSPE believes that professional development, not only of engineers individually but the profession as a whole, is dependent on the degree to which individual engineers are willing to work and support, with their time, talent and resources, activities directed toward a stronger engineering profession. The local chapter is the unit where each professional engineer and engineer-in-training has an opportunity to do his part and also to express his opinions on vital matters concerning him and his profession. The chapter, therefore, is the foundation on which rests not only the strength and future of NSPE, but the improved status of engineering. It is vital, therefore, that chapter officers and committeemen take seriously the duties they are assigned. The key to getting started, of course, is the chapter president. He is the catalyst for all the chapter activity.

The National Committee on Chapter Activities has as its function stimulating strong local units of professional engineers. This Committee is now preparing a publication to assist primarily the chapter president at the time he assumes his office. While it will be of prime interest to him, it is believed other officers and key chapter workers will find help from some of its contents.

There are, of course, other aids for chapter officials. The Public Relations Newsletter supplies helpful ideas for the Public Relations Committee; the Membership Memo assists the Membership Committee; the Legislative Bulletin keeps Legislative Committees posted on national legislative matters; and the AMERICAN ENGINEER carries reports on what other chapters have found to be outstanding chapter events.

All of the above are merely aids to strong chapter activity. The real impetus for development of chapters and their continued growth comes from the state organization. Similar aids and assistance have been developed with even more direct emphasis on local matters by our more progressive State Societies. Each level of the NSPE three-level organization can be more effective the closer it gets to the individual engineer. Professional activity, founded on the individual engineer, integrated in his local chapter, the chapters coordinated into the state organization and the state organizations making up the national organization, demonstrate the effectiveness of the organizational pattern of the National Society of Professional Engineers.

The whole is no stronger than its parts. If each member resolves during the summer lull to do his part this year, stronger Chapters, stronger State Societies, a stronger NSPE, and a stronger, more vital force for a better engineering profession will result.—*End.*

# Committee Work Again Will Be Major Factor In Success Of NSPE's Program

By CLARENCE T. SHOCH, P. E.,
*President, NSPE*

NEARLY 200 of NSPE's stalwarts will carry on the committee work of the Society during the next year. Because of the importance of the committee function in developing policies and practices for our over-all program, I thought it would be of interest to all to know how members are selected for this particular work and of some of the recent assignments given these groups.

New NSPE President, Clarence T. Shoch, P. E.

A list of prospective committee chairmen and members is obtained initially from the State Societies through the National Society's regional vice presidents. The State Societies call upon the Chapters for their suggestions. This procedure is in keeping with our democratic three-level organization; also, the officers and boards of the State Societies and Chapters know much more intimately of the capabilities and activities of members and thus can be specific in their suggestions for committee placements. The lists from the states within the various regions are then screened by the regional vice presidents, who add and comment according to personal knowledge of the competence of members, and forward the list to the president-elect.

In making final selections, it is important that NSPE attempt to enlist the services of the most competent and industrious members for all committee posts. First consideration, appropriately, is in the choice of chairmen. Here, the procedure is to set down for each of the more than twenty functions covered by the different committees the names of members either known personally by the president-elect or recommended by others as having the training and experience—and a willingness to make both freely available to the Society—to best organize and direct the work. In many instances such men are already working effectively at the helm of a particular committee and are willing to continue. Frequently, the present chairman will suggest that someone else be given an opportunity and, in many instances, has recommended his successor. Geographical considerations play only a small part.

Likewise, the prospective committee members are listed according to their understanding of a particular phase of professional work. Here, however, the number of members needed is large enough to permit proper attention both to geographical location and justifiable representation according to the size of the respective State Societies. Such broad distribution of committee personnel provides the needed nation-wide viewpoints. Too, it should be remembered that it is important that as many men as possible be brought into the national picture.

Throughout the selection procedure there is, invariably, the instance where for one reason or another a proposed chairman or a committee member is unable to accept. This, at times, involves a number of reassignments to re-establish adequate coverage.

Many of our new committees this year have already started aggressively on their activities. Several held meetings at the time of the Annual Meeting in Milwaukee. There will be no summertime lull for these wide-awake groups. Some specific assignments already handed to committee chairmen for consideration and possible activation include the following:

AWARDS—Establish a firm procedure for year-after-year selection of outstanding engineers on the basis that in honoring others we honor ourselves.

BUDGET—Determine the long-range financial effect of our present Life Membership provision and make appropriate recommendations.

CHAPTER ACTIVITIES—Suggest chapter programs that not only attract new members but, equally important, hold existing members.

CONSTITUTION AND BYLAWS — Appraise the present type organization and its operational procedures in the light of greatly expanded membership and activity.

EDUCATION — Obtain industry-wide opinion as to what is expected, education-wise, in an engineering graduate; also, develop ways of encouraging secondary school students and their teachers toward a higher understanding and appreciation of mathematics and the sciences.

EMPLOYMENT PRACTICES — Take a good look at the conditions of engineering employment in government, private practice, construction and the educational fields.

ENGINEERS IN INDUSTRY — Continue the current aggressive study and make recommendations on industry employment and the union situation.

ENGINEERING PRACTICES — Develop the pros and cons of various forms of business vehicles by which engineering services are made available to clients and relate these to professional concepts.

ETHICAL PRACTICES — Advise on the propriety of specific engineering advertising recently observed.

INTERPROFESSIONAL RELATIONS — Advance the common goals between engineers and architects, and with the other professions.

INTER-SOCIETY RELATIONS—Maintain full cooperation with other engineering groups.

UNITY — Review recent suggested programs for unification of the profession and suggest new approaches in professional work.

MEMBERSHIP—Explore ways of developing NSPE as a vehicle for serving the interests of all registered engineers.

NATIONAL DEFENSE—Prepare a program of engineers' assistance according civilian defense.

PUBLIC RELATIONS—Encourage observance of National Engineers' Week and greater public relations activity at the local level.

REGISTRATION—Work toward uniformity across the country in engineering laws and the manner of licensing.

SALARY AND FEE—Renew data on the levels of remuneration existing for engineers in the various branches and fields.

YOUNG ENGINEERS—Focus the attention of older engineers on the problems of those just entering the profession.

IN addition to this listing, our service committees are equally active in making the programs of the above groups more effective and in handling the operational work of the Society. These committees need the considered opinions of members all over the country to aid them in formulating the ultimate programs to be recommended to the Board. In the interest of having the programs as complete and as workable as possible, it is our earnest request that each member volunteer his particular knowledge of a situation to the appropriate committee.

The committee personnel have dedicated themselves to a year of intense effort. Certainly we as members should try to make this task productive and pleasant by helping them at each opportunity.—***End.***

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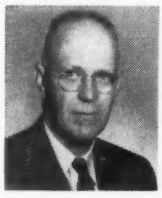

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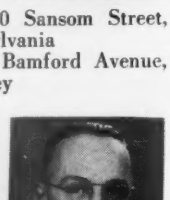

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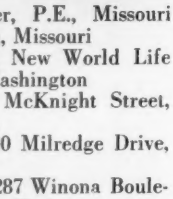

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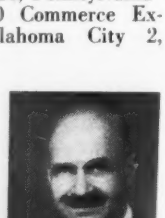

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# ASEE Issues Report on Engr. Education

"The determination of the pattern which engineering education should take in the future must, of necessity, be based upon the obligation of the engineering profession to society, and on the importance of the development of the student as an individual." This is one of the major conclusions stated in the *Interim Report of the Committee on Evaluation of Engineering Education*, which has just been published by the American Society for Engineering Education.

The report is the result of a project organized in 1952 when the special committee was appointed by the then ASEE president, S. C. Hollister, and financed in part by contributions from the constituent societies of the Engineers' Council for Professional Development, the Engineering Foundation, and General Electric Company. The general purpose of the study was "to determine the pattern or patterns that engineering education should take to keep pace with the rapid developments in science and technology, and to educate men who will be competent to serve the needs of and provide the leadership for the engineering profession over the next quarter-century."

The Interim Report, as presented by the committee, divides the review of the problem into four main topics—Objectives of Engineering Education and Their Implementation, The Selection and Development of an Engineering Faculty, Curricular Content as Related to the Objectives of Engineering Education, and Evolution of a Common Stem of Engineering Curricula.

Emphasizing that the "state of engineering is far from static, for engineering is essentially a creative profession," the committee makes a number of important points in its report, including the assertion that "the existence of outstanding faculties is far more important to the advancement of engineering education than details of curricula or the magnificence of facilities." Particular attention is also paid to the fact that, in addition to possessing technical competence, the professional engineer must also be "an informed and participating citizen, and a person whose living expresses high cultural values and moral standards. . . ."

The observations of the committee are directed more fully toward the problems of undergraduate education, with a recommendation, which will be carried out, that a comprehensive investigation of graduate study requirements be undertaken separately by ASEE.

# *Publication of Compendium of Registration Laws Announced*

Alfred L. McCawley, attorney and former Missouri State Senator, has announced the forthcoming publication of "Professional Engineering Registration Laws," a book covering such laws in all 48 states and the territories.

The volume is the culmination of an extensive three-year research project undertaken by Mr. McCawley with the assistance of NSPE.

The book is a compendium of all phases of state legislation dealing with the practice of professional engineering, according to C. Y. Thomas, vice-president of Spencer Chemical Co., and chairman of an NSPE committee working in cooperation with the author.

The other two members of this committee are C. G. Roush and R. J. Rhinehart.

**The book is expected to appear in September, the publishers said. It will sell for $8.75 but will be available for a short time to NSPE members for $5. See page 31.**

Mr. McCawley, who was admitted to the Missouri Bar in 1900, has served in both the State Senate and the House of Representatives. He has been active in securing the passage of laws involving registration of architects and engineers, and is the author of many articles on this subject.

Mr. McCawley lives in Carthage, Mo., and has been counsel for the Missouri State Board of Registration for Architects and Engineers since 1941.

## book looks

***The Book:*** **Proceedings of a Conference on THE UTILIZATION OF SCIENTIFIC AND PROFESSIONAL MANPOWER**

***Sponsored by:*** **National Manpower Council**

***The Publisher:*** **Columbia University Press**
**2960 Broadway, New York 27, N. Y.**

***Price:*** **$3.50**

***Reviewing the Book:*** **Former NSPE Vice President Chester Lichtenberg, P. E.**

These proceedings have been recently published in a 209-page book by the Columbia University Press. It records the results of a 5-day conference held October 7-11, 1953, at Arden House on Harriman Campus at Columbia University in the City of New York.

The conference findings have been summarized under the headings of utilization problems, and some of the ways in which more effective utilization can be secured.

Under the heading of utilization problems, the conference found three outstanding ones. First, the demand for scientific and professional personnel is likely to remain strong throughout the rest of the decade. Second, the fields of teaching and medicine are characterized by conditions of chronic shortages. Third, the low birth rate of the 1930's has placed, and for some years, will continue to place, a limit on the size of college and postgraduate enrollments, and, therefore, on the number studying for the professions.

Under the heading of more effective utilization, the conference found six outstanding means for improvement. First, the transference of work from professional persons to technicians and assistants. Second, the increased use of capital to permit the full employment of professional skills. Third, the development and use of incentives to prevent the wasteful turnover of professionally trained personnel. Fourth, the development and use of new work patterns to improve the total output of professional and semiprofessional personnel working in concert. Fifth, a reassessment of the appropriateness of the education and the training of professional persons. Sixth, improved leadership and administration.

An economist member of the conference observed that the current shortages of scientific and professional manpower are largely a function of the exceptionally high level of business. He also felt that college teaching should be made a more attractive career.

A representative of the International Labor Office stressed the importance of the conference for the work of those organizations which are providing technical assistance for underdeveloped countries in the field of highly trained personnel.

Another speaker called attention to the relationship between the problem of manpower utilization and the market economy with its remarkable mechanism allocating scarce resources.

The last participant to speak thought that some fundamental issues had not been adequately examined. He made the point that, although higher salaries and other incentive improvements might increase the supply of teachers, the core of the problem was not more teachers but better education. He stressed an approach which would indicate how much, rather than how little, we ha in the way of manpower resources.

The National Manpower Council believes that progre is being made, and that the cumulative results of its su cessive investigations will eventually provide a valid fram work for manpower analysis and appraisal.

The National Manpower Council consists of 19 mem bers representing six groups. Universities are represente by 7 members, Industry by 4 members, Associations b 3 members, Government by 2 members, the Press by members, and the legal profession by one member. has published two reports and has a third report in prep ration. These are as follows:

Student Deferment and National Manpower Polic —April 1952

A Policy for Scientific and Professional Manpow —May 1953

A Policy for Technical and Skilled Manpower— Fall 1954

The participants in the conference included 66 per sons from organizations representing 5 fields. Universities were represented by 22, Government by 20, Industry by 12, Associations by 9, and Foundations by 3. They ap peared to be or to have been engaged in activities classed into four groups. Teaching was represented by 23, Engineering by 15, Medicine by 15, and others by 13.

Utilization of personnel in the fields of Engineering, Medicine, and Teaching was treated separately for each. First, there was a presentation of the thinking of one of the participants at the conference. Then there were discussions of a working group for each of the three fields. Then there was a report to the Conference by the Chairman of each of the Working Groups. Then there was a Conference Discussion of the Report of each of the Working Group Chairmen. Finally, there was the presentation of a summary of the conference findings, and brief comments on the general situation.

Results of the conference were a meeting of minds on the problem, and the development of conclusions for resolving it.

## *Meet the Reviewer . . .*

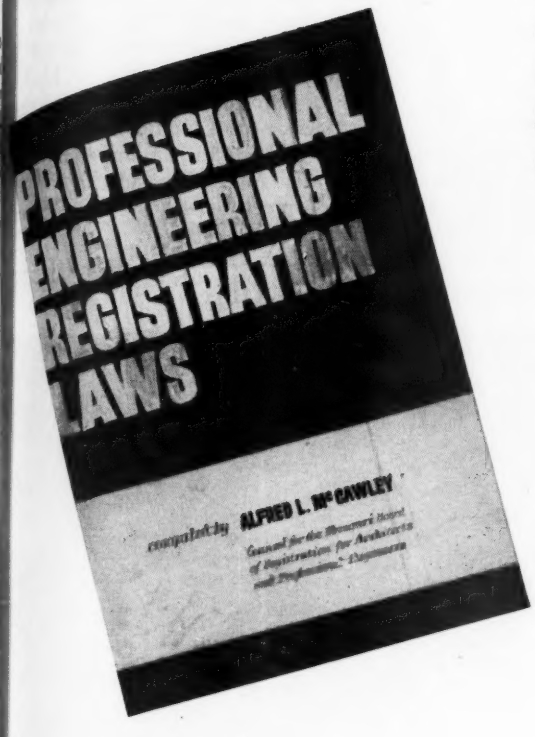
Col. Chester Lichtenberg is a well-known electrical and mechanical engineer of Fort Wayne, Indiana. He has also won national recognition for his efforts in behalf of civil defense, and he now serves as CD director of Allen County, Indiana.

**Col. Lichtenberg**

Col. Lichtenberg was born in New York City and is a graduate of Columbia University. He served in the Army during World War I, and he has had an extensive and varied civilian career on the staff of the General Electric Company. In addition, from 1942 to 1949 he was administrator of the Product Quality Association; and since 1952 he has been senior engineer with Mott of Washington and Associates.

He is a past president of the Indiana SPE. He has been a vice president and a national director of NSPE and has held several national committee chairmanships. He is also a member of many other engineering societies and civic and military organizations.

# HERE IT IS . . .




***At long last, a compendium of Registration Laws for Professional Engineers in all 48 States, Alaska, Hawaii, Puerto Rico, and the District of Columbia.***

This is a book that belongs on the shelf of every professional engineer's reference library. Compiled by a recognized authority in the field of professional registration, the book presents, state by state, the exact legal requirements that must be met for professional practice. This unique volume covers in detail such elements of the state laws as temporary permits, fees and bonds, the filing of maps, certificate applications, education requirements, examinations, and public works projects. The laws are cited for reciprocity, registration renewals, corporate and partnership practice, revocation of registration, and violations and penalties.

## Don't Miss This Pre-Publication Offer

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Because of NSPE's early and continuing interest in the field of registration for professional engineers, the National Society is making pre-publication copies of this valuable book available to members at a special price of $5. *After October 1st, the cost of the book will be $8.75.* Take advantage NOW of this big saving. This is a book for the consulting engineer, and the engineer in industry, government and education. Engineering students and EIT's will find it especially valuable.

## WHAT OTHERS SAY . . .

"Within these covers will be found answers to numerous questions that have been asked by State Boards of Engineering Examiners, by member State Societies of the National Society of Professional Engineers, and by many individuals regarding registration laws. In the preparation of this Compendium, the author has been most painstaking . . ."

—T. Carr Forrest, Jr., P.E.,
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—C. G. Roush, P.E.,
Manager, Westinghouse Electric Corp.,
Kansas City, Mo.

"In this volume one may readily find the desired information concerning any engineering registration law. Moreover, he will in a very short time acquire a better knowledge and higher appreciation of the objects and purposes of registration of professional engineers."

—C. Y. Thomas, P.E.,
Vice President of
Spencer Chemical Co.,

### *The Author*

**Alfred L. McCawley, a Missouri State Senator for many years, is the author of numerous published articles on professional registration for engineers and architects. A sponsor of the Missouri securities law, he is counsel for that State's Board of Registration for Architects and Professional Engineers. His legal career dates back to 1900, when he was admitted to the Missouri Bar.**

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# With Our Members . . .

*Summer Activities*

## Many Program Schedules Include Picnics and Other Outdoor Events

Summertime has become "party time" for the engineers as well as for many other groups throughout the country. The Ohio Society of Professional Engineers, for one, has scheduled its fourth annual outing at Camp Muskingum, Conotton, Ohio, for August 23-29. Local Ohio chapters, too, have been including events for the entire family in their summer program schedules. The Franklin County Chapter held its annual family picnic at the Ohio State University Golf Course in Columbus on June 22, while the Cleveland P.E.'s sponsored their nineteenth annual golf party at the Ridgewood Country Club on July 15.

The St. Louis and Western Chapters of the Missouri Society have already held their customary family picnics, while members of the MSPE's Southeast Chapter are still looking forward to their annual barbecue which is scheduled for September 11 at the country club in New Madrid.

The Northeast Chapter of the Pennsylvania Society had a picnic scheduled for July. The Capital Chapter of the Illinois Society sponsored its picnic on July 27. And a like event for all the family is being planned by the East Bay Chapter of the California SPE for August 21 at the Laurel Picnic Ground in Berkeley.

In Texas, the Travis Chapter's Activities Committee arranged that the June, July, and August meetings should be light social events in keeping with the warmer weather. The June meeting was a barbecue held jointly with the members of the Bexar Chapter at Landa Park in New Braunfels. The annual stag picnic and barbecue is to be held this month. And a similar story is being repeated in many other chapters as the summer progresses.

### *Nebraska Society Selects New Leaders*

The election of new officers for the Nebraska Society of Professional Engineers for the coming year was announced during the Society's recent annual meeting in Omaha. Those elected for the 1954-55 administrative term are. C. W. Durham, president; Raymond H. Reed, president-elect; John C. Detweiler, vice president; A. R. Homan, secretary; Robert E. Kinckiner, treasurer; George E. Miller, alternate national director; and J. Vaulx Risser, Elmer H. Cordes, and Theodore L. Frank, state directors.

In addition, incoming President Durham announced the names of the chairmen of the various State Society committees. They are: Harold G. Garner, membership; Theodore L. Frank, Professional Practice and Ethics; Jerome J. Gill, Publications; Stanley A. Michael, the outgoing president, Public Relations; B. H. Backlund, Salaries and Fees; and Clifford L. Dier, NSPE-AGC Joint Committee. Past President Michael was also designated to represent the Nebraska SPE on the board of directors of the Nebraska Engineering Society.

Former NSPE President Sidney L. Stolte was guest speaker for the banquet at which the new officers were introduced. His talk was entitled *The Future of the World is in the Hands of Engineers*, and in it Mr. Stolte emphasized the importance of being civic-minded as well as achieving technical excellence.

### *Registration L Is Tulsa To*

A recent meeting of the Tulsa Ch ter of the Oklahoma Society was gi over to a program dealing with sired and needed revisions for Oklahoma Registration Law. Lead the consideration of this import problem were Chapter President W liam J. Fell and Membership V President W. R. Clarke.

The meeting was held at Danne Cafeteria in Tulsa.

### New Presidents Assume Office

**The first picture above was made at the Philadelphia Chapter's recent annu meeting and shows the chapter's retiring president, Ralph W. Hoch, left, as h congratulates incoming President Harold L. Bauder before turning the offic gavel over to him.**

**The photograph at the right is of Major Otto Mald, USAR, who has just bee elected president of the Bronx County Chapter of the New York State SPE. Maj Mald is a construction engineer in the office of the Borough President of th Bronx in charge of highways, streets, and sewers.**

### *Topeka Meetin Features Installatio Of New Officer*

Highlight of the recent annu meeting of the Topeka Society of Pr fessional Engineers was the electio and installation of new officers for th 1954-55 term. The new administrativ slate as presented by the Nominatin Committee included: L. Duane Wa rafen, president; W. A. King, vic president; Carl Hultgren, secretary Charles B. West, assistant secretary Signor Fink, treasurer; C. M. Cosie chapter director; and W. W. Main state director.

Mr. Mains, the outgoing presiden also presided at the meeting.

Ross Keeling, chief engineer for th Kansas Highway Commission, was th featured banquet speaker.

## *Portsmouth P.E.'s Sponsor Gala Event*

The annual "Ladies' Night" dinner sponsored by the Portsmouth Chapter of the Ohio SPE was one of the most outstanding banquets to date, according to all reports. The dinner, at which Chapter President Harlan Danner presided, marked the climax of a particularly successful season of professional and social activities.

Entertainment for the event was provided by the local high school's "Trojan Minstrel Group" under the direction of Kenneth Amick.

Although the Portsmouth P.E.'s have suspended regular monthly meetings for the summer season, plans are already well under way for a series of top-flight programs to start in September, according to W. H. Walter, vice president, and G. B. Fuller, secretary-treasurer, who have been working on the 1954-55 schedule.

## *Raritan Valley P.E.'s Honor Frank Mirgain*

Members of the Raritan Valley Society of Professional Engineers gave a testimonial dinner recently to honor Frank C. Mirgain of Highland Park, N. J., distinguished chapter member who is leaving to accept an appointment as dean of engineering at North Dakota Agricultural College. (See *Professional News in Capsule Form*, this issue.)

A past president of the New Jersey SPE, Mr. Mirgain has long been active in professional engineering circles, and particularly in the Raritan Valley group. Since 1949 he has been head of the Department of Civil Engineering at the Coopers Union in New York City.

In addition to the Raritan Valley officers and members who turned out to honor the new dean, representatives of the state and national societies and other engineering groups also participated in the tribute. The dinner was held at the Far Hills Inn near New Brunswick.

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**THREE PRESIDENTS MEET—Another recent meeting of the Raritan Valley Chapter of the New Jersey SPE (see story above) was marked by the attendance of incoming presidents at three levels of NSPE membership. The picture at the right shows the three, then presidents-elect. Left to right they are: Jerome T. Waldron, the Raritan Valley group's newly-elected president; Clarence T. Shoch, now NSPE president; and Charles Stillman, incoming president of the New Jersey SPE.**

**Mr. Shoch was the featured speaker at the meeting. He discussed the problem of unionism.**

## *New Edition Of R. W. Abbet's Book Is Published*

A third revised edition of Robert W. Abbett's book on *Engineering Contracts and Specifications* has recently been published by John Wiley & Sons, Inc.

Mr. Abbett, a member of the New York Society, is a partner in the New York consulting firm of Knappen-Tippetts-Abbett-McCarthy. He has had extensive experience as a consultant, engineering teacher, and construction manager.

The new edition of his book presents the latest, up-to-date information of value to all persons interested in the fundamental legal aspects of construction work.

## *Delaware Society Announces New Officers*

Recently-elected for the 1954-55 administrative term are the following officers of the Delaware Society of Professional Engineers: Thomas B. Evans, president; David L. Arm, senior vice president; Whitney R. Adams, vice president; Frank O. Hayes, secretary; West T. Lamborn, Jr., treasurer; and William A. McWilliams, national director. Mr. McWilliams' term as national director runs to 1956.

State directors from the various Delaware chapters are: Walter B. McKendrick, Jr., Kent County; John L. Bahr, New Castle County; John I. Cahalan, New Castle County; and Samuel R. Ewing, Sussex County.

E. Powell Smith is the immediate past president of the Society.

## *Pennsylvania Engineer Receives Citation*

J. Earl Frazier, president and secretary of Frazier-Simplex, Inc., of Washington, Pa., was one of four prominent persons receiving Achievement Citations at the recent 155th commencement of Washington and Jefferson College. Mr. Frazier's award was bestowed in recognition of his achievements in engineering and also for his civic activities in behalf of Washington, Pa.

He is a member of the Pittsburgh Chapter of the Pennsylvania SPE and also is a past vice president of the Washington County Chapter. In addition, he has served as director of the Washington County Motor Club, as chairman of the Washington County Branch of the Pennsylvania Economy League, and as a director of Washington Hospital.

## *Architect Addresses San Jose Engineers*

Kurt Gross of the architectural firm of Gross and Marburg was the featured speaker at the July meeting of the San Jose Chapter of the California Society. Mr. Gross, who is a member of the American Institute of Architects and a past president of the Coast Valleys Chapter of the California Council of Architects, discussed the AIA organization and activities, educational and licensing requirements for architects, and architect-engineer relations.

For their August meeting, chapter members are planning a field trip through the new $50 million Ford assembly plant at Milpitas.

**. . . more news on page 35**

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## *Los Angeles P.E.'s Hold Annual Dinner*

The annual dinner-dance of the Los Angeles Chapter, California SPE, was held recently at Ciro's in Hollywood with Xavier Cugat's orchestra furnishing the music and entertainment.

During the course of the banquet, Oliver E. Deatsch gave a brief address dealing with NSPE programs and policies. Mr. Deatsch also served as master of ceremonies for the event.

## *Sabine Chapter To Publish Directory*

A resolution that the Sabine Chapter of the Texas SPE publish a chapter directory was adopted by the members during a recent meeting at Lamar Tech. The action was taken on a motion by T. Carlton, after a special committee headed by Marvin E. Neel recommended publication of the directory.

## *News From Kansas*

Members of the Eastern Chapter of the Kansas Society of Professional Engineers gathered recently for a dinner meeting at the Hotel Olathe to hear reports of chapter accomplishments during the past year and greet new officers whose election was announced during the meeting.

Incoming president for the Olathe area P.E.'s is Paul Haas. Other new officers are: Clay Roberts, vice president; A. C. Becker, secretary-treasurer; Malcolm Steele, state director; and Raymond Campbell, chapter director.

## *Klassen Speaks In Rockford*

C. W. Klassen, president of the Illinois Society of Professional Engineers, was the guest speaker at a recent meeting of the Rockford Chapter. Mr. Klassen discussed his observations made during a recent trip through the Far East and also showed slides of photographs made during the trip.

The meeting was held at the Elks Club in Rockford, and a buffet dinner was served to the members and their guests.

**NORTH DAKOTA OFFICERS—** Pictured at the right are the 1954 officers of the North Dakota SPE. They are: l. to r., L. W. Veigel, vice president; A. W. Anderson, president; R. H. Myhra, national director; and Joseph R. Kirby, secretary.

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production for every worker, for every section of every plant and mine, and for each factory and mine as a whole. Failure to attain the norms is punished and performance in excess is rewarded. Furthermore, in industry and science, competitions of all kinds are constantly held.

For example, in a given territory there may be a contest among blacksmiths. The winner receives the title of "Eminent Blacksmith," is hailed in the Soviet press as a Soviet "Hero," and is publicly honored by Soviet officials.

The results of the program of scientific and engineering education in industrial expansion in the U.S.S.R. are of great significance. The industrialization programs carried through prior to the war enabled Russia, during hostilities, to produce enormous outputs of war materiel.

Since the war, the pace of its industrial effort has been steadily and greatly increased. Today in the output of coal, steel, and electricity, Russia is the second nation in the world. Its production of coal and lignite has risen from 146,000,000 short tons in 1938 to 322,000,000 tons in 1952 and will go to 416,000,000 tons in 1955, plus 65,000,000 tons of peat. For the same period, Great Britain's production of coal was practically stationary, 254,000,000 tons in 1938, and 253,000,000 tons in 1952.

Soviet steel output jumped from 19,500,000 tons in 1937 to 38,000,000 in 1952 and will exceed 48,000,000 tons in 1955. This compares with Great Britain's output of 17,600,000 tons in 1952 and the U. S. production of 93,300,000 tons in 1952.

In electric power, Russia's output rose from 36,400,000,000 kilowatt hours in 1937 to 116,400,000,000 kilowatt hours in 1952. This is almost twice the British output of 59,000,000,000 and the West German output of 54,000,000,000 in 1952. It is still far below our American total of 462,600,000,000 kilowatt hours, but the rate of Russia's increase is more rapid than ours.

We have in these figures the picture of a nation gearing its economy to preparation for war on a tremendous scale. Remember that Hitler's Germany was producing only 25,000,000 tons of steel when he started World War II in 1939. Remember, too, that if Soviet rulers so desire they can devote practically their entire tonnage of steel to war requirements. With only 10,000,000 tons of steel production available to Russia outside the area overrun and devastated by the German armies during the war, the Soviets turned out planes, tanks, machine guns, shells, and ammunition at a rate that, in many instances, equalled that of the United States and in some categories surpassed our production, although we had seven or eight times as much steel output.

The mining picture is a little different, however. When the Kremlin rulers ruthlessly, mercilessly, and unwaveringly started to regiment and sacrifice the lives of their people to build up overwhelming economic power, they understood that its

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cornerstone is modern, efficient coal mining. The development of a creative mining machinery industry, therefore, was a basic necessity. They had foreign machines of many kinds, cutters, loaders, conveyors, drills, and pneumatic picks, of British, American, and German origin in their mines. Furthermore, they had and have unimpeded access to all the patents and to the technical and scientific publications, both private and governmental, with all their immeasurable wealth of information, that record the current industrial and scientific progress of the Western World in mining.

THEY copied such of these machines as would give them the most immediate increase in mechanization, but even before the war they were designing new and more productive machines for their own particular conditions. Their main objective was mechanized continuous mining and they produced numbers of continuous mining machines of various types for use on their long wall mining faces.

In an article in the "New Sketch," of India, on June 18, 1953, A. M. Terpigorev, member, Academy of Science and Stalin Prize Laureate, said: "Practically all the arduous operations had been mechanized already before the war. And, in recent years, Soviet designers, working in cooperation with engineers and miners, have created more than 130 new types of machines. The Soviet coal-mining industry occupies first place in the world for the degree of mechanization of labour."

That statement is strictly a piece of glittering propaganda designed to impress Nehru and the people of India with the alleged miracles of Soviet industry and the heaven of Russian Communism. Let us apply a few hard facts to Comrade Terpigorev's rhetoric. First, if Soviet designers have created more than 130 new types of machines, when they need only a dozen or so, that means that more than 100 of them have been failures. Second, from Soviet publications themselves, we have convincing evidence that the Russian coal mines are far from being completely and wonderfully mechanized.

Thus, one of *Pravda's* correspondents, in an article a year ago, criticizing the inadmissible lag of mechanization in the Moscow Basin, stated that: ". . . coal loading with the help of combines and loading machines has been mechanized almost 30 per cent in the Donets Basin and 40 per cent to 50 per cent in Karaganda and the Kuznetsk Basin . . . but only 4.5 per cent in the Moscow Basin."

Another glimpse of the facts is permitted through the visit of a committee of Scottish Communist coal miners to the Donbas, the big coal producing field in the Ukraine, last summer. They visited two of the best mines in that field, Nikitovka 4/5 and Number 1 Central in Craznamesk. The chairman of that committee, Mr. Abe Moffat, made a secret report on his return to Scotland.

Pages from that report not only show pictures of machines being used underground, but give some very interesting figures. For instance, Nikitovka 4/5 has 3,500 employees, including outside workers, and the mine produces 1,000,000 short tons of coal per year, or about 3,800 tons per shift. This is approximately 1.2 tons per man per shift, from a supposedly superior mine. That output is no better than the average for all the mines in Great Britain and is decidedly below the figure for British mines that have been fully mechanized. It compares with an average of 6.4 tons per man shift for all American mines. But many American mines, fully mechanized with our most modern equipment, average 20 to 30 tons per man shift.

AT Number 1 Central, another mine employing 3,500 workers, including administrative, outside and building workers, etc., 2,350 tons is the daily output. If one-third of the men employed there were used in work extraneous to mining, the output would still be no better than 1 ton per man per shift.

Thus, the actual facts show a great divergence between the grand over-all results claimed by the Kremlin rulers and advertized to their people as solid accomplishments and the day by day performance in their coal mines.

But in the higher levels of the Soviet coal mining administration, there is vision, determination, and planning for new machines and techniques that must command our interest and respect. In July, 1953, U.S.S.R. First Deputy Minister of the Coal Industry, A. Kuzmich, listed the future objectives of his organization. They include machines and methods for continuous, automatic mechanical mining, including mechanized timbering and continuous rock tunneling machines.

From abundant sources, we know that Russian manufacturing is characterized by wide variations in technological advancement, management, and operating efficiency within and between different industries.

The best showing is in the manufacture of machine tools and transportation equipment, where the man-year productivity is about 75 per cent of that in the United States. This is to be expected, because these industries have received very high priority in the Soviet scheme of things as necessary in their armament program as well as in the expansion of their industrial potential.

In ferrous metallurgy and other high priority industries, Soviet productivity hardly equals that of 1937. In the iron and steel industries, for instance, the necessity to use poorer coal has offset their technological advances and productivity is probably little better than in 1937, or about 45 per cent that of the American iron and steel producers.

In general, the poorest Soviet performances are found in the textile, sugar refining, paper, cement, chemical, building, and consumer fields. Over-all man-year productivity is up 20 per cent from 1937, exactly the amount by which the compulsory work week has been lengthened; viz. from 40 hours to 48 hours.

Now, a word or two about factors affecting Soviet productivity. Their plant and equipment is fairly good, but the quality of their labor force is poor because of a very large proportion of female and child labor. In agriculture, women constitute about 60 per cent of all labor, in civilian non-agricultural employment 50 per cent. In mining, where women, during the war, both above and underground constituted nearly the entire labor force, even today 20 per cent of the employees are women. Public health, education, municipal services, and commerce employ 60 to 80 per cent women. This, of course, is, in part, due to the enormous losses of manpower, 25,000,000 men, directly and indirectly, during the war.

The task of industrializing Russia is so huge that it cannot all be done under top priority. Furthermore, to hasten the accomplishment of their major objectives, the Soviet leaders have set up severe stresses in their economy and between different groups in their population. Thus, workers in the machine tool, transportation, and armament industries are paid more than twice as much as workers in many other manufacturing

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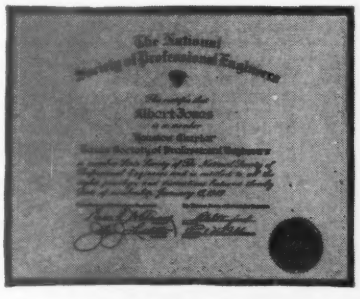

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(*Continued from page* 38)

industries, even in the same towns and territories, and they are paid five times as much as workers on the farm. These stresses are adversely affecting their over-all efficiency and progress.

ONE crucial fact about Communist Russia we must ever keep clearly in mind; namely, when the Soviet leaders give top priority to a particular project and, regardless of all interference, ruthlessly focus their best brains and facilities on that one objective, as a lens focuses the light and heat of the sun to an incandescent point, they accomplish amazing results. Witness the developments in their military aircraft, nuclear fission, and atomic bombs. Therefore, we must not for one moment underrate the immeasurable danger presented by the U.S.S.R.'s implacable determination to destroy us.

In this situation, we rely upon our statesmen in the present "cold" war, and upon our armed forces if it becomes a "hot" war. But we must remember every moment that in the end both our political and military leaders rely upon us. The infinite responsibility rests upon our engineers, scientists, and manufacturers to outstrip our Soviet enemies and to maintain such superiority over them that fear of instant retaliatory obliteration will keep the peace of this world.

It is my own conviction that we can do it if we all understand the immensity and the nature of our tasks, and this includes our government officials and especially the members of Congress.

God grant that we assume the responsibility with full knowledge of its gravity and discharge our consequent obligations to the full.—***End.***

***Are You a Chapter Public Relations Committee Chairman?***

**If so, your name and mailing address should be on file at NSPE Headquarters. The first mailings of material for NSPE's *expanded* PR program will begin in early fall. You will want the Public Relations Kit and other valuable aids that will be sent to every PR Committee Chairman.**

**If you have not already done so, send your name and mailing address now to National Headquarters, 1121 15th St., N.W., Washington, D. C.**

# Strictly Business

***Personalities*** . . . The election of JOHN O. BICKEL, RUSH F. ZIEGENFELDER, and WILLIAM H. BRUCE, JR., to partnership in the New York consulting engineering firm of PARSONS, BRINCKERHOFF, HALL & MACDONALD has recently been announced. . . . The MELLON-STUART CO., Pittsburgh, has announced the appointments of HOWARD E. DYKEMAN as chief engineer and DON E. BENSON as manager of construction. . . . ROBERT S. PRICE has been named general manager of the SEIBERLING RUBBER COMPANY'S Plastics Division at Newcomerstown, O., near Akron. . . . A. RALPH ECKBERG has been elected president and a director of RIDGE CONSTRUCTION CORPORATION, a subsidiary of EASTMAN KODAK COMPANY. . . . Admission of ARNOLD H. VOLLMER as a general partner of BROWN & BLAUVELT, New York consulting engineers, has been announced jointly by FRANCIS L. BROWN and HAROLD A. BLAUVELT. . . .

Mr. Dykeman

AMERICAN LOCOMOTIVE COMPANY has announced the appointment of F. B. REYBOLD as assistant to W. F. LEWIS, vice president—marketing. . . . DWIGHT H. LADD has been named manager of the Dallas, Tex., plant of FEDERAL ELECTRIC PRODUCTS COMPANY and its subsidiary, PACIFIC ELECTRIC MANUFACTURING CORPORATION.

Mr. Mason

JOHN W. MASON has been appointed district manager of the Detroit office of ALLEN-BRADLEY COMPANY, electrical control manufacturers of Milwaukee, Wis. . . . ARTHUR C. BRYAN has been named vice president and general manager of consumer products and WILLIAM H. FEATHERS, vice president and general manager of industrial products of NATIONAL CARBON COMPANY, a division of UNION CARBIDE AND CARBON CORPORATION; and WALTER A. STEINER has been appointed vice president in charge of development for the same firm. . . . JEREMIAH TEMPONE has accepted appointment as an engineer with the EXPORT-IMPORT BANK OF WASHINGTON. . . . E. G. ROBBINS has been appointed general manager of construction for WALTER KIDDE CONSTRUCTORS, INC., engineers and builders of New York and Houston. . . . R. F. EDGAR has been named to head the new regional Chicago offices of the WARNER ELECTRIC BRAKE & CLUTCH COMPANY of Beloit, Wis. . . . HAROLD E. LEWIS has joined the sales staff of THE PARKER APPLIANCE COMPANY, Cleveland, to head the firm's hydraulics training program.

According to an announcement made in Chicago by C. D. FRANKS, president of the PORTLAND CEMENT ASSOCIATION, JAMES E. DUNN has been designated district engineer in charge of the Association's new Orlando, Fla., office, while ANDREW J. SPRADLIN has been named to head another new office in New Orleans, La. D. L. CHANEY has been selected to succeed Mr. Dunn as manager of the Washington, D. C., office. . . . E. H. STAU has joined the OLYMPIC SCREW & RIVET CORP., Downey, Cal., as vice president and director of sales. . . . VICTOR A. OLSON has been appointed manager of AIRSUPPLY COMPANY of Beverly Hills, Cal., a division of THE GARRETT CORPORATION. . . . J. A. ZURN MFG. CO., AMERICAN FLEXIBLE COUPLING COMPANY, Erie, Pa., and its associates have announced the appointments of JOHN HENRY ZURN as vice president in charge of sales and ALBERT A. BAKER as sales administrator. . . . LEONARD LIMON has been named manager of the Industrial Boiler Feed Department of GRAVER WATER CONDITIONING COMPANY, a division of GRAVER TANK & MFG., INC., N. Y.

►

***New Industrial Laboratories*** . . . A new laboratory of the ROBERTSHAW-FULTON CONTROLS COMPANY is nearing completion at Anaheim, California. According to JOHN A. ROBERTSHAW, company president, the new facility will be devoted solely to the research and development of "advanced, intricate and complex devices required by modern warfare." . . . A new multimillion-dollar sound laboratory and test center for the world's most powerful transformers will be built at WESTINGHOUSE ELECTRIC CORPORATION'S Transformer Division plant in Sharon, Pa., according to FRANK L. SNYDER, vice president in charge of the division. The proposed over-all building for the test center has been designed by PRACK AND PRACK of Pittsburgh and the sound laboratory by COMMONWEALTH ASSOCIATES of Jackson, Mich. . . . Construction has recently begun on a new Pittsburgh research center for the JONES & LAUGHLIN STEEL CORPORATION, according to HERBERT W. GRAHAM, vice president in charge of research. It is expected that the laboratory will be completed by mid-1955; it will house the more theoretical of the corporation's research activities. PRACK & PRACK are the architects, while RAGNAR BENSON, INC., are the contractors.

►

***Operational Expansion*** . . . A new plant for the production of vinyl acetate monomer is to be built by AIR REDUCTION COMPANY, INC., of New York at Calvert City, Ky. The plant, which will have a capacity of 30,000,000 pounds per year, is scheduled to be in operation early in 1956. Engineering of the new plant will be by the LUMMUS COMPANY. . . . Completion of an expansion program and the consequent moving of office and production facilities to Michigan City, Ind., has been announced by the PHILLIPS DRILL COMPANY, manufacturers of Phillips self-drilling expansion shells.

►

***New Firms*** . . . HOWARD FOUNDRY COMPANY has announced the formation of a new Chicago subsidiary, HOWARD ELECTRIC COMPANY, which will manufacture a new type of electrical underfloor system for office and industrial buildings. JAMES W. HUDSON has been named general manager and A. J. CARROLL, assistant manager in charge of engineering and production. . . . RICHARD C. THOMPSON and FRANK E. CORNWALL, president and executive vice-president of MACCO PANPACIFIC CO., international engineers and contractors, have announced in New York that they have acquired all of the outstanding stock and current construction contracts of that company and will in the future operate under the corporate name of THOMPSON-CORNWALL, INC. Mr. Thompson will serve as president of the new firm.

Mr. Hudson

# What's New

**AMERICAN ENGINEER** August, 1954
**1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.**

Please send information on Item 1 to:

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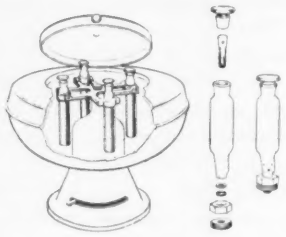
## NEW SEPARATORY FUNNEL — Item 1



A new glass separatory funnel developed by Fischer & Porter Company eliminates stopcock lubrication and freezing problems. The "Ultramax" valve of the separatory funnel consists of a teflon plug which turns on the natural glazed surface of an unground, precisely-formed section of pyrex tubing. The unit is adapted to centrifuging, and product contamination is avoided because valve lubricants are unnecessary. The inert teflon valve cannot freeze regardless of the fuel being handled. Various funnel sizes from 30 ml to 2 liters are available in the globe type, squibb type, or cylindrical type.

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Please send information on Item 2 to:

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## NEW DRAFTING TAPE APPLIES EASILY — Item 2

A new drafting tape has just been introduced by Behr-Manning Corp. which should relieve some sticky problems for the whole league of workers who must use the drawing board or drafting table. Because of its controlled adhesive qualities, the new tape, will: hold tracing paper or cloth firmly on drafting or drawing boards; come off the roll cleanly, apply easily; leave no defacing or discoloring marks on the drawing paper or cloth. Resists breaking off during unrolling and application but, at the same time tears crosswise readily enough so user needs no scissors.

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Please send information on Item 3 to:

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## SPEEDS USE OF FIRE EXTINGUISHERS — Item 3

Rubber-tired ball bearing cart, known as the Pull-it, has been designed by Ansul Chemical Co. to transport their dry chemical fire extinguishers quickly to the scene of a fire. Particularly suitable where fire hazards are dispersed over large areas. Can easily maneuver narrow factory aisles. The 30-pound extinguisher mounted on unit can be equipped with six feet of rubber hose, permitting operation of extinguisher from cart. 44" high, 16" wide, 13" deep, 16 pounds.

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Please send information on Item 4 to:

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## NEW-TYPE CONCRETE BUILDING BLOCK — Item 4

An improved design for concrete building blocks, which is said to provide increased strength of construction and a 20% decrease in the overall building costs, has been developed by the American Webco Corp. New design includes a sizable increase in cells, thereby increasing compression strength by 25% without adding additional weight. Improvements are said to retard sound transmission, eliminate moisture penetration.

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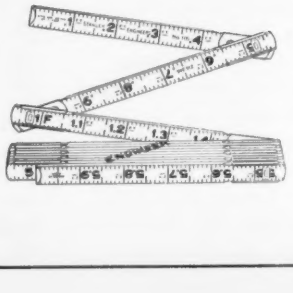
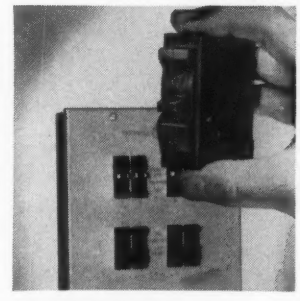
## NEW "GREEN END" ENGINEERS RULE — Item 5



A new "Green End" Engineers Rule No. 116 made by Stanley Tools, is designed for Civil Engineers, Surveyors, and general contractors—for those who use 10ths and 100ths of a foot, or feet in inches by 16ths, on the job. One side features engineer's marking —inside flat reading graduated in 10ths and 100ths of a foot so that figures and graduations lie close to the work. Called "mistake-proof" because foot and decimal marking appears at each 10th, and each foot is marked in red. Double edge graduations.

**This column describes new products of general interest to professional engineers. For further information, fill in the coupon provided and mail to the AMERICAN ENGINEER.**

## NEW CIRCUIT BREAKER — *Item 6*



Trumbull Components Department of General Electric Company today announced a new Type "R" Circuit Breaker for the residential construction market. Competitively priced. Features include a *positive action mechanism*, which enables the contacts to break instantly thereby protecting them from excessive burning and arcing; a *trip indicating handle* to show which breaker is tripped. Even if handle is held on, *trip free contacts* will open under an excessive overload or short circuit. Listed by Underwriters' Laboratories.

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Please send information on Item 6 to:

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## NEW HOT SURFACE ALUMINUM PAINT — *Item 7*

An improved hot surface aluminum paint is announced by United Laboratories, Inc. as formula "SP-415." Coating is designed purposely for all metal surfaces subjected to heat up to 1000° F. Combines fine aluminum paste with a special vehicle and is shipped in double compartment containers. Applied to surfaces while warm, it is purposely adapted for use on such equipment as boilers, pipes, heaters, flues, retorts, and other similar surfaces subjected to heat. Applied by brush or spray; takes only two hours to dry. One gallon covers about 500 square feet and may be applied either interior or exterior.

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Please send information on Item 7 to:

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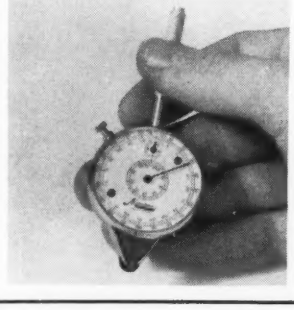
## CURVIMETER REGISTERS FOOTAGE — *Item 8*



The time-consuming difficulties of blueprint scaling have become a thing of the past with the introduction of the Minerva Curvimeter. This high-precision instrument, developed by M. Ducommun Company, records up to 2400 feet of straight *or curved* distances, a unique and exclusive Minerva feature. It is simple to operate and easy to handle, yet gives split-second, accurate measurements that will be particularly valuable in estimating, purchasing, construction and engineering applications.

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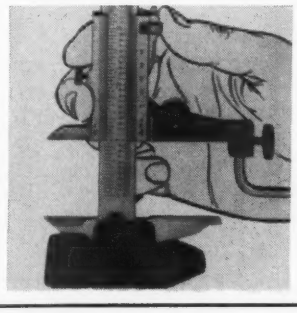
## COMBINATION CALIPER-HEIGHT GAGE — *Item 9*



A radically new Mauser combination Vernier Caliper and Height Gage is announced by George Scherr Co. The "Microlock," features an entirely new design, combining the time-saving advantages of quick-adjustment and rigid tightness of the slide, with a micromatic fine adjustment mechanism. Omitting the commonly used separate Fine Adjustment Slide results in approximately one inch increase of measuring capacity.

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Please send information on Item 9 to:

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## HOLDER FOR LEADS OF ALL DIAMETERS — *Item 10*

Koh-I-Noor Pencil Co. Inc., is introducing the first push-button holder for use with leads of all diameters in all degrees. The heart of the newly-invented holder is the so-called Adapto-Clutch, a gold-lined and ingeniously engineered collet to tightly clutch leads of any diameter, from 9H to 6B. Guaranteed slip-proof against vertical pressure and turn-proof in all lead sharpeners and machines. Knurled for easy gripping.

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# *"...through a person-to-person canvass..."*

**ROBERT S. MACFARLANE**
*President*
*Northern Pacific Railway Company*

***"Combine a good product with enthusiastic salesmanship, capably directed, and favorable results are reasonably certain. This winning combination through a person-to-person canvass recently added more than 8,000 employees of the Northern Pacific Railway to the Payroll Savings Plan for purchase of U. S. Savings Bonds. It is gratifying to me that the organized efforts of Northern Pacific personnel not only have resulted in substantially increased systematic saving and a greater investment in America's future by our employees, but that the Treasury Department is using our campaign as an example throughout the railroad industry in its efforts to step up regular purchases through payroll deductions."***

The U. S. Savings Bond *is* a good product . . . Payroll Savers *are* enthusiastic Bond Salesmen . . . company spirit *was* good because everybody on the Road knew that Mr. Macfarlane was 100% behind the effort to increase employee participation in Northern Pacific's Payroll Savings Plan.

But, there was still another, and very important, factor in the success of Northern Pacific's campaign that added more than 8,000 new Payroll Savers — a Person-to-Person Canvass.

A good Person-to-Person Canvass is an organized employee effort that puts a Payroll Savings Application Blank in the hands of every man and woman in the company. There is no pressure, no drive to "sign up." Every employee is free to make his own decision. That's all there is to a Person-to-Person Canvass, but in literally thousands of companies, as on the Northern Pacific, a high percentage of employees *want* to build their personal security and are quick to join the Payroll Savings Plan when its availability and many advantages are brought to their personal attention.

Upwards of 8,000,000 employed men and women are enrolled in the Payroll Savings Plan, most of them as a result of Person-to-Person Canvasses. Each month these Payroll Savers invest more than $160,000,000. The 1954 goal is 9,000,000 Payroll Savers. It can be reached if you and other executives will take a personal interest in the Plan and what it means to your employees, your company and your country.

If your company has the Payroll Savings Plan your State Director will be glad to help you organize a Person-to-Person Canvass that should increase employee participation to 50%, 60% or more. If you do not have a plan he will show you how easy it is to install one. Write to Savings Bond Division, U. S. Treasury Department, Washington, D. C.

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SEPTEMBER 1954

# American Engineer

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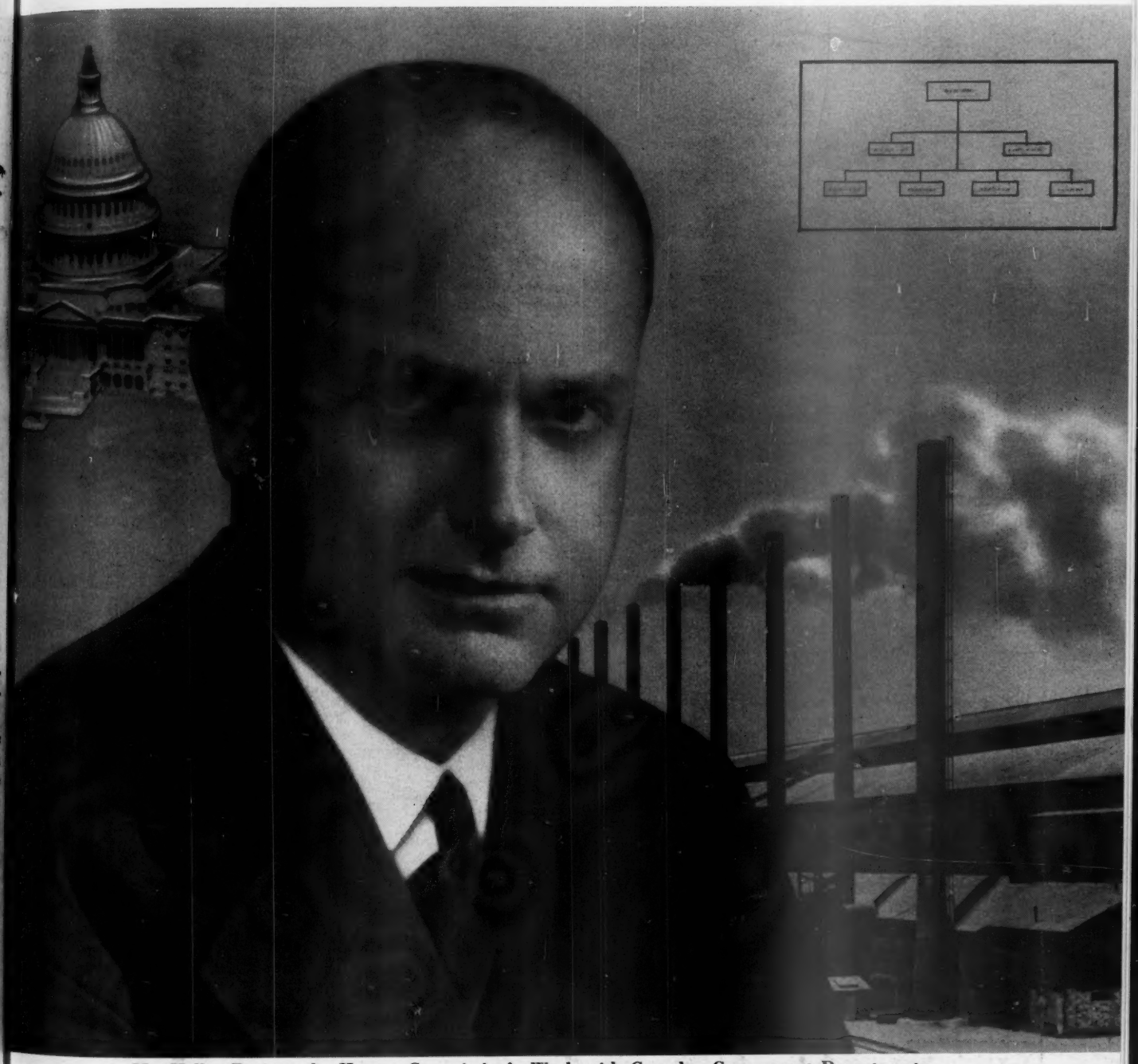
## IN THIS ISSUE . . .

- **Engineering with the Hoover Commission**

**By**
**Robert Heller,**
*of Robert Heller and Associates*



**Mr. Heller Reviews the Hoover Commission's Work with Complex Government Departments**

## . . . *Also*

**gineering Models—the Answer to Industrial Headaches —A Photo Story—**

**Complete Report on NSPE's New Building**

**Plus Late Washington News, Special AE Report, Professional Items**

# . . . NEW LITERATURE . . .

*To help the offering firms determine which literature you require, when requesting an item, be sure to list all specifications shown . . . and say you saw it in the AMERICAN ENGINEER.*

**ASPHALTIC COATINGS BOOKLET—The Insul-Mastic Corporation of America is offering an eight-page booklet providing considerable asphaltic protective coating information in easily read form. In addition to rust prevention, the booklet names the following uses of Insul-Mastic reinforced asphaltic coatings: Vaporsealing thermal insulation, waterproofing building walls, dampening sound and vibration, controlling condensation and insulating. The booklet is available upon request. Write to The Insul-Mastic Corporation of America, 1141 Oliver Building, Pittsburgh 22, Pa.**

—AE—

DISPERSIONS FOR INDUSTRY BULLETIN — How "dag" colloidal dispersions serve industry in a wide range of uses is thoroughly treated in a new Bulletin published by Acheson Colloids Co. A centerfold table lists 40 basic dispersions of graphite, molybdenum disulfide, vermiculite, and zinc oxide, in carriers such as water, oil, volatile hydrocarbons, resin solutions, alcohol, glycol, and wax emulsions. 108 specific products and processes aided by "dag" dispersions are mentioned. In addition to the more common lubrication, metal-working and electrical applications, selected dispersions used as interior and exterior coatings for television tubes, opaquers for the graphic arts, reproducible soil standards for textile and detergency research are among those mentioned. Available from Acheson Colloids Company, Division of Acheson Industries, Inc., Port Huron, Mich.

**PELLET-TYPE CALCIUM CHLORIDE—A sixty page manual, entitled Peladow, gives a complete and authoritative report on the newly developed, high-test, pellet-type calcium chloride and is published by The Dow Chemical Co. It explains the rapid and simple unloading methods that have been devised for the pellets, storage and handling of calcium, and points out the significance of the bulk factor. Sections are devoted to Peladow's use in connection with highways, concrete, tire ballast, coal shipments, and others. Featured is a step-by-step, illustrated explanation of the recommended procedure for unloading tank cars of dry Peladow by a process of dissolving with water and pumping to storage or mobile units for immediate application. Thirty-five photographs and a dozen charts and graphs are incorporated in the manual. The manual can be ob-**

GRADALL PUBLICATIONS — A factual, four-page folder concisely reviewing the recently announced Crawler-Mounted Gradall has just been issued by the Gradall Division of the Warner & Swasey Co., showing how the crawler is driven and maneuvered with hydraulic power, covers the controls for the machine, and gives its working ranges in chart form. Warner & Swasey also announce "The Gradall Man," a quarterly for owners and operators.

Each issue will contain a feature story on a construction project involving earth-moving problems. Write to The Warner & Swasey Company, 5701 Carnegie Avenue, Cleveland 3.

**HEAT EXCHANGER TUBES BOOKLET — Aluminum heat exchangers is the subject of "Alcoa Aluminum Heat Exchanger Tubes," latest in the Aluminum Co. of America technical booklet series. Alcoa's new booklet presents the complete story on these tubes, emphasizing factors that provide the combination of low cost and corrosion resistance which makes aluminum heat exchanger tubes attractive to industry. Part of the 24-page, two-color booklet covers the economies in using Alcoa heat exchanger tubes. Other sections report service and laboratory experience in the use of aluminum heat exchanger tubes with cooling waters, discussing successful applications of aluminum exchangers in the petroleum, and related industries. Such operations as catalytic cracking, desulfurization, ammonia recovery, nitric acid handling and hydrocyanic acid condensers are discussed and pictured. A section of fabrication, including general design data and alloy recommendations, precedes a technical data section. Copies are available from Aluminum Company of America, 728 Alcoa Building, Pittsburgh 19.**

GRINDING AND MOUNTING WHEELS BOOKLET—A new plastic bound reference book on grinding wheels has been issued by Chicago Wheel & Manufacturing Co. All types of Grinding Wheels, Flex Wheels, and the new Break Resistant Cut-Off Wheels are fully described in a most conveniently indexed form. Proper operating speeds of all types of grinding wheels are given on large easy to

**101 WAYS TO APPLY ELECTRIC HEAT—Principal industrial electric heating applications and methods are described in a new 32-page booklet, "101 Ways to Apply Electric Heat," by Edwin L. Wiegand Co., manufacturers of Chromalox electric heating units. Illustrated case histories show experience-tested ways to apply metal-sheathed electric heating units in myriad industrial jobs. Physical aspects of installation are shown along with a description of the problem, solution and advantages obtained. Some of the heating jobs illustrated could not be done with any fuel except electricity. Similar treatment is given to problems of heating air and gases; liquid heating; melting soft metals and viscous materials, and heating machinery and equipment parts, such as dies, platens, molds and moving parts. Other types of heating include applications in metal finishing, plastics, chemicals, foundries and electroplating. A section is devoted to far-infrared heating, showing 28 typical uses for this new method. For a free copy of the new Chromalox Booklet, write to Edwin L. Wiegand Co., 7621 Thomas Blvd., Pittsburgh 8, Pennsylvania.**

STAIRWAY CONSTRUCTION—A new booklet describing the use of Jones & Laughlin Steel Corporation's Junior Channels in stairway construction is now available. The booklet provides specifications for the Junior Channels, and shows some of the buildings in which the channels have been used as stair stringers. Requests for the booklet should be addressed to Public Relations & Advertising Department, Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

—AE—

**AIRCO HELIWELD CATALOG—A 16-page catalog by Air Reduction covers in detail features of the Heliwelding process and the equipment used with it. The catalog describes and illustrates in actual welding operation, the manual holders either air or water-cooled, light or heavy duty water cooled machine holders for use with the semi-automatic equipment, the automatic head that can be used with the Heliweld process, and automatic hardfacing process using vibratory feeder. Heliwelding is Airco's tungsten arc welding process which uses an inert-gas shield of helium or argon or both to protect the weld from contamination by the atmosphere. It joins light gauges of the "hard-to-weld"**

# Letters

## Creed Available . . .

Dear Editor:

As Chairman of the Ethical Practices Committee, which was charged with the responsibility of developing a creed for our profession, I was gratified and highly pleased that the creed submitted at the Milwaukee meeting of the Board of Directors was approved.

Now that we do have a creed I believe enough of our membership will be interested to justify publication of the creed by NSPE in suitable form for framing. I am sure many of our engineers will want to display the creed in an appropriate place.

LESLIE C. GATES, P.E.,
Beckley, W. Va.

▶ **The creed is now in the hands of the artists and the printers and will soon be available in a form suitable for framing at nominal cost.—*Editor.***

## P.E. or Not P.E. . . .

Dear Editor:

Theorizing on whether a young man should become an Engineer or join a labor union provides interesting reading and your articles in AMERICAN ENGINEER have provoked much serious thought on my part because I am extremely interested in the future of my 18 year old son who is now struggling to acquire a college education but is having a hard time in doing so. . . . This summer he is working for me, in the field as an electrical apprentice at $2.00 per hour, $80.00 for a 40-hour week, and is in love with his work, dirty and hard as it is.

He is working, on a permit, with a crew of members of the International Brotherhood of Electrical Workers, whom he respects and they in turn think highly of him and his work, attitude and ability.

These union men, whom I have been employing for the last 26 years and in most cases are upright, respected citizens in their community, receive a base pay for a Journeyman of $3.50 per hour, a Foreman $3.85 per hour and a General Foreman $4.25 per hour.

In addition to this they receive 11 per cent in fringe benefits including compensation and liability insurance, old age benefits, pension and welfare benefits.

My regular men earn from $8,000 to $11,000 per year, working fifty-two 40-hour weeks plus the benefits mentioned, with no responsibility other than to know how to interpret a specification and how to get production out of a gang of their fellow members.

There are plenty of jobs for foremen and general foremen and it would only take me about 6 years to put my son into one of these jobs.

I have men who have been employed steadily for over 20 years. At 19 years of age a young man is facing 3 to 4 years of service with a reserve period of 3 years more which added to his 4 years of college, if he is lucky enough to get out in that time, makes him at least 25 years of age when he is ready to go to work as a cadet or a cub engineer for maybe $5,000 a year.

On the other hand if he works for 4 years and gets his Journeyman's card at 22 and $140.00 a week and does a stint of 2 years

(*Continued on page* 5)

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Systems engineers conduct studies to determine operational requirements . . . create and synthesize military equipment concepts . . . guide development of new integral elements . . . conduct evaluation programs to determine operational effectiveness.

*You may qualify!* Professional ***ability*** to create and analyze over-all complex systems and ***experience*** in electronic or electro-mechanical systems engineering required.

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